238

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

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SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 3 IN SET 189

Arvin Models 7210CB, CM, 7214CM and 7218CB, CM (Ch. TE337, -1) are covered in Photofact Folder 3, Set 189. Model 7212CFP has now been added to this group.

In later production the following changes were made.

Ch. TE337-2

TO EXTEND THE RANGE OF THE HORIZONTAL HOLD CONTROL

The horizontal hold control (R4) was changed from 30KΩ to 50KΩ and R116, in series with the control, was changed from 91KΩ to 100KΩ.

TO IMPROVE THE NOISE CLIPPING CIRCUIT

R132 and C6, in the low voltage power supply, were deleted.

A 1KΩ resistor was added from the 220 volt source to the junction of C37, R24, which was formerly connected to 120 volts.

Pin 6 of V7 was connected to 135 volts.

R47 was connected to 250 volts.

A 56KΩ resistor and a .01MFD capacitor, connected in parallel, were added in series with the lead from the junction of R41, C80 and C81 to pin 1 of V9.

R84, V10 grid was changed from 330KΩ to 470KΩ.

Ch. TE337-3

TO INCREASE THE DRIVE OF THE VIDEO AMPLIFIER

R42 was changed from 3.9KΩ to 2.7KΩ.

C51 was deleted.

L25 was changed to 185 microhenries, wound on a 15KΩ resistor.

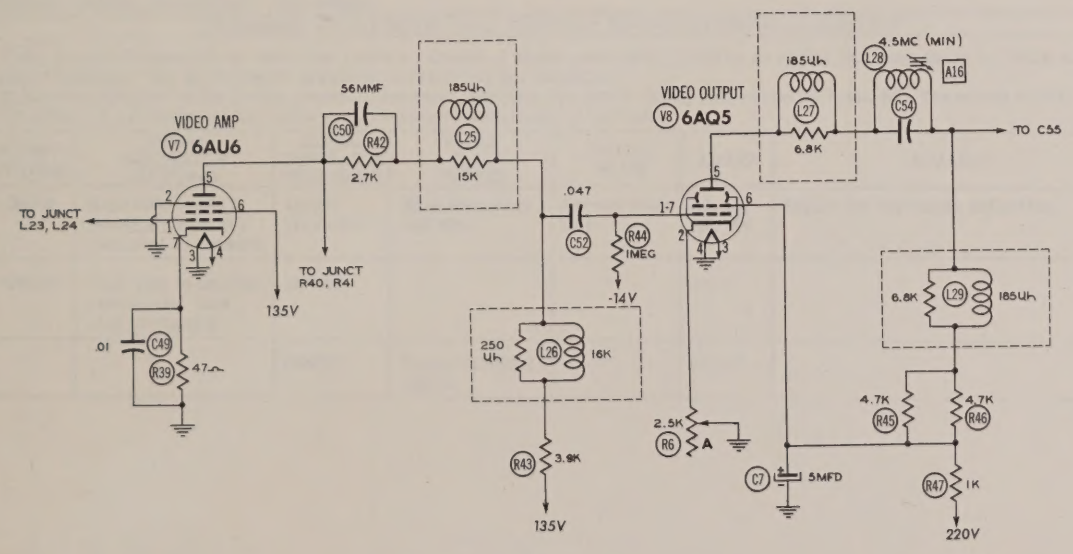
L26 was changed from 93 microhenries to 250 microhenry coil, wound on a 16KΩ resistors.

C53 was deleted.

L27 was changed to a 185 microhenry coil, wound on a 6.8KΩ resistor.

L29 was changed from 93 microhenry coil to a 185 microhenry coil, wound on a 6.8KΩ resistor.

A partial schematic, showing the revised circuit is given below.



(Continued on the next page)

PROPERTY OF
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3924 MEADE ST.
DENVER, COLORADO

ARVIN MODELS 7210CB, CM, 7212CFP, 7214CM, 7218CB, CM (Ch. TE337-2, -3, -4, -31)

PRODUCTION CHANGES
BULLETIN 93

PRODUCTION CHANGES
BULLETIN 93

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Ch. TE337-3 (Cont'd)	TO REDUCE PEAK CURRENT IN 5U4 TUBES A 25Ω, 14 watt resistor (part #C23970-20) was added between pins 2 of V25 and V26,and C1A.
Ch. TE337-31	HORIZONTAL OUTPUT TRANSFORMER CHANGED The horizontal output transformer was changed from part #E40117 to part #E24989 and the width coil was changed from part #C40098 to part #C24991. The winding between terminals 2 and 6 is not included in this transformer and an AGC secondary is added to the width coil. When this transformer is used the lead from the junction of C80, R108 and R109, which formerly was connected to terminal 6 of the horizontal output transformer, is connected to the top of the width coil secondary and the bottom of the secondary is grounded.
Ch. TE337-4	PICTURE TUBE CHANGED The picture tube (V26) was changed from a 21MP4 to a 21AP4 tube. When the electrostatic tube is used the Ion Trap is changed from part #C25662-2 to part #C25662-3 and the centering magnet (part #D25626) is replaced by a focus magnet (part #C23910-2). TO ELIMINATE BARKHAUSEN OSCILLATIONS A 93 microhenry choke was added in series with the plate lead of V21. TO REDUCE SNOW R84 was changed to 220KΩ. TO STABILIZE SCREEN VOLTAGE ON V5 R36 was changed from 33KΩ to 1KΩ and connected to 135 volts instead of to 220 volts.

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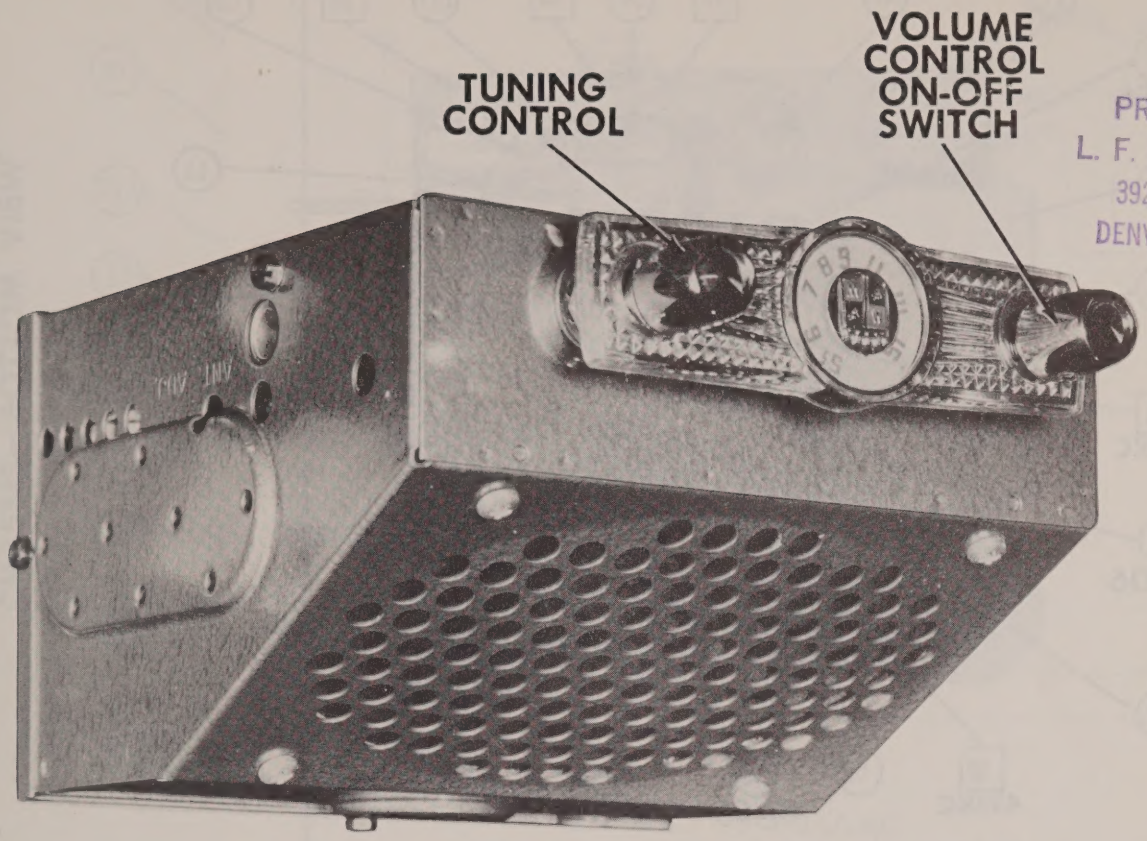
AIRLINE
MODEL 35BR-6796A



AIRLINE
MODEL 35BR-6796A

TRADE NAME	Airline Model 35BR-6796A
SUPPLIER	Montgomery Ward & Co., 619 Chicago Ave., Chicago, Ill.
TYPE SET	Battery Operated AM Superheterodyne Receiver for Automobiles
TUBES (Five)	Types 6BD6 RF Amp., 6BE6 Conv., 6BD6 IF Amp., 6AV6 Det.-AVC-AF Amp., 6AS5 Audio Output
POWER SUPPLY	6 Volt Storage Battery RATING 4.4 Amp. @ 6.3 Volts
TUNING RANGE—BROADCAST	540-1600KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
If an individual part of the tuning assembly becomes defective the entire tuning unit should be replaced. The tuning cores are adjusted and sealed at the factory and require no adjustment in the field.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 7 (grid) of 6BE6 (V2). Low side to chassis.	455KC (400~Mod)	High frequency end stop	Across voice coil	A1, A2, A3, A4	Adjust for maximum deflection.
2.	50MMF	High side to antenna receptacle. Low side to chassis.	1620KC	"	"	A5	"
3.	"	"	1300KC	Tune to 1300KC signal	"	A6, A7	"

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA		RETMA BASE TYPE	NOTES
		AIRLINE PART No.	STANDARD REPLACEMENT		
V1	RF Amplifier	6BD6	6BD6	7BK	
V2	Converter	6BE6	6BE6	7CH	
V3	IF Amplifier	6BD6	6BD6	7BK	
V4	Det-AVC-AF Amp.	6AV6	6AV6	7BT	
V5	Audio Output	6AS5	6AS5	7CV	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	AIRLINE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	■20	200	8C-21726	AFH2-26		C071			TVL-2515	Note 1
B	▲20	200		PRS25/25					TVA-1206	
C	40	25								
C2	.047	200	8D-21723	P288-047	DF-503	PTE4S47		PT4147	2TM-S47	
C3	90	500	8F-21949							
C4	.0047	200	8D-21819	P288-0047	D6-472	PTE4D47	GP2-333-472	PT4247	2TM-D47	
C5	10		8G-19502	SI10N750	TCN-10		N750K-100	NT-541	5TCU-Q1	
C6	47		8G-12198	SI47N750	TCN-47		N750K-470	NT-5447	5TCC-Q47	
C7A	100		*201-15005	*PA-97	*PC-50		*1403-01	UC-531	*100C1	
B	100							UC-531		
C8	.01	200	8D-21820	P288-01	D6-103	PTE4S1	GP2-333-103	PT411	2TM-S1	
C9	.0047	200	8D-21819	P288-0047	D6-472	PTE4D47	GP2-333-472	PT4247	2TM-D47	
C10A	5000									
B	250		♦17A-21742	♦PA-112-1	♦PC-70		♦1406-01		♦104C4	
C										
C11	.01	400	8D-20828	P488-01	D6-103	PTE4S1	GP2-333-103	PT411	4TM-S1	
C12	.047	400	8D-21831	P488-047	DF-503	PTE4S47		PT4147	4TM-S47	
C13	.5	100	8D-19810	VHC-36		MP2P5		RF480	HC-3	
C14	.5	100	8D-19810	VHC-36		MP2P5		RF480	HC-3	
C15	.01	1000	8D-21826	P1088-01		PTE16S1		PT1611	MB-S1	
C16	1000		8G-20878		FT-1000					
C17	220	500	8F1-233							

Note 1. Some Models use a 30/20/40 @ 200-25 Volts in this application.

* Items C7A, C7B and R8 are combined in one unit.

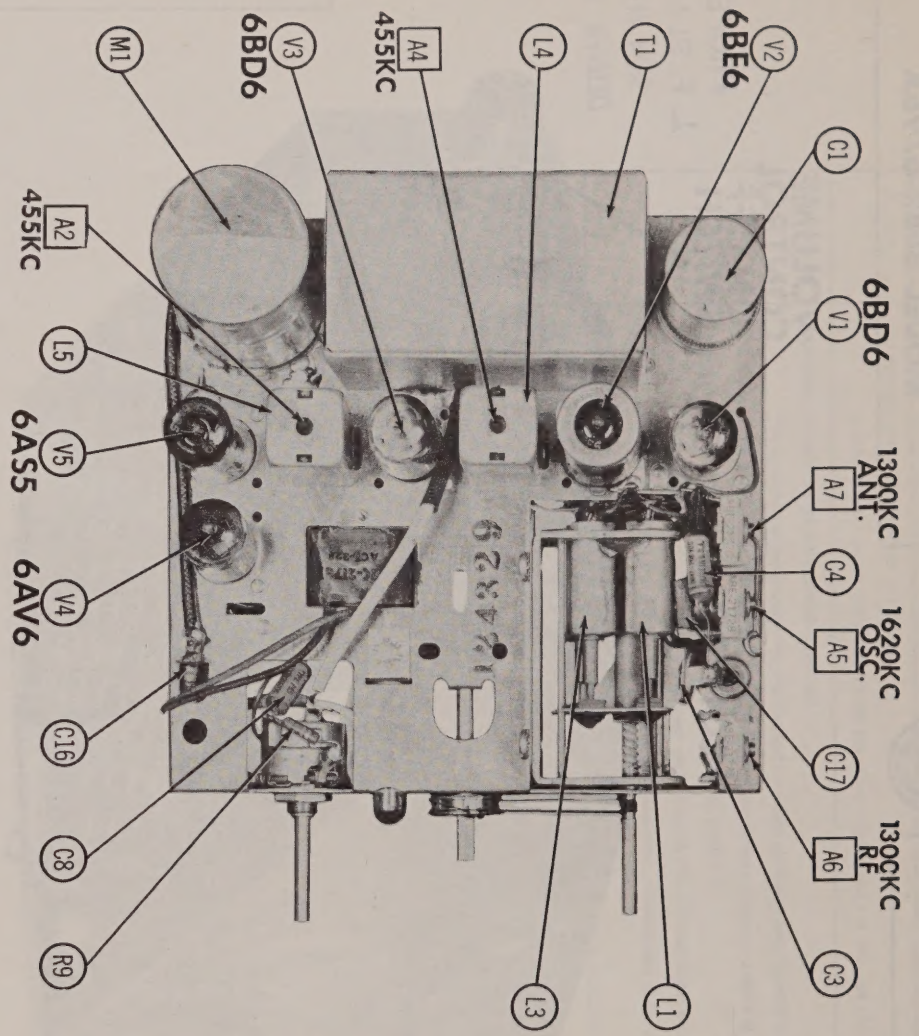
♦ Items C10A, C10B, C10C, R11A and R11B are combined in one unit.

▲ Items C10B and C10C should total 250MMF.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	AIRLINE PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1A	500KΩ	½	A10A-21722	Q18-133 X	AK-80	ABT-62	UT-429	Volume tapped at 50K
B	Shaft			NQ	RS-3/16	AK-8	PS-37	Attach to R1A
C	Switch			76-1	SWB	KB-1	US-26	Attach to R1A

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	AIRLINE PART No.	IRC PART No.	
R2	1 Meg	½	9B1-98	BTS-1 Meg	
R3	220Ω	½	9B1-54	BTS-220	
R4	1 Meg	½	9B1-98	BTS-1 Meg	
R5	47KΩ	½	9B1-82	BTS-47K	
R6	2. 2Meg	½	9B1-102	BTS-2. 2Meg	
R7	220Ω	½	9B1-54	BTS-220	
R8	47KΩ	½	*201-15005	BTS-47K	
R9	22KΩ	½	9B1-78	BTS-22K	
R10	6. 8Meg	½	9B1-108	BTS-6. 8Meg	
R11A	470KΩ	½		BTS-470K	
B	470KΩ	½	♦17A-21742	BTS-470K	
R12	220Ω	½	9B1-54	BTS-220	
R13	1200Ω	2	9B4-63	BTB-1200	
R14	68Ω	½	9B1-48	BTS-68	
R15	68Ω	½	9B1-48	BTS-68	
R16	3300Ω	½	9B1-68	BTS-3300	

* Items R8, C7A, C7B are combined in one unit.
♦ Items R11A, R11B, C10A, C10B, C10C are combined in one unit.

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA					
	PRI.	SEC. 1	SEC. 2	SEC. 3	AIRLINE PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.
T1	6. 3VCT 2. 3A	310VCT . 061ADC			12A-21729					

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	AIRLINE PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.	
T2	4. 6KΩ	3. 3Ω	12C-21731						

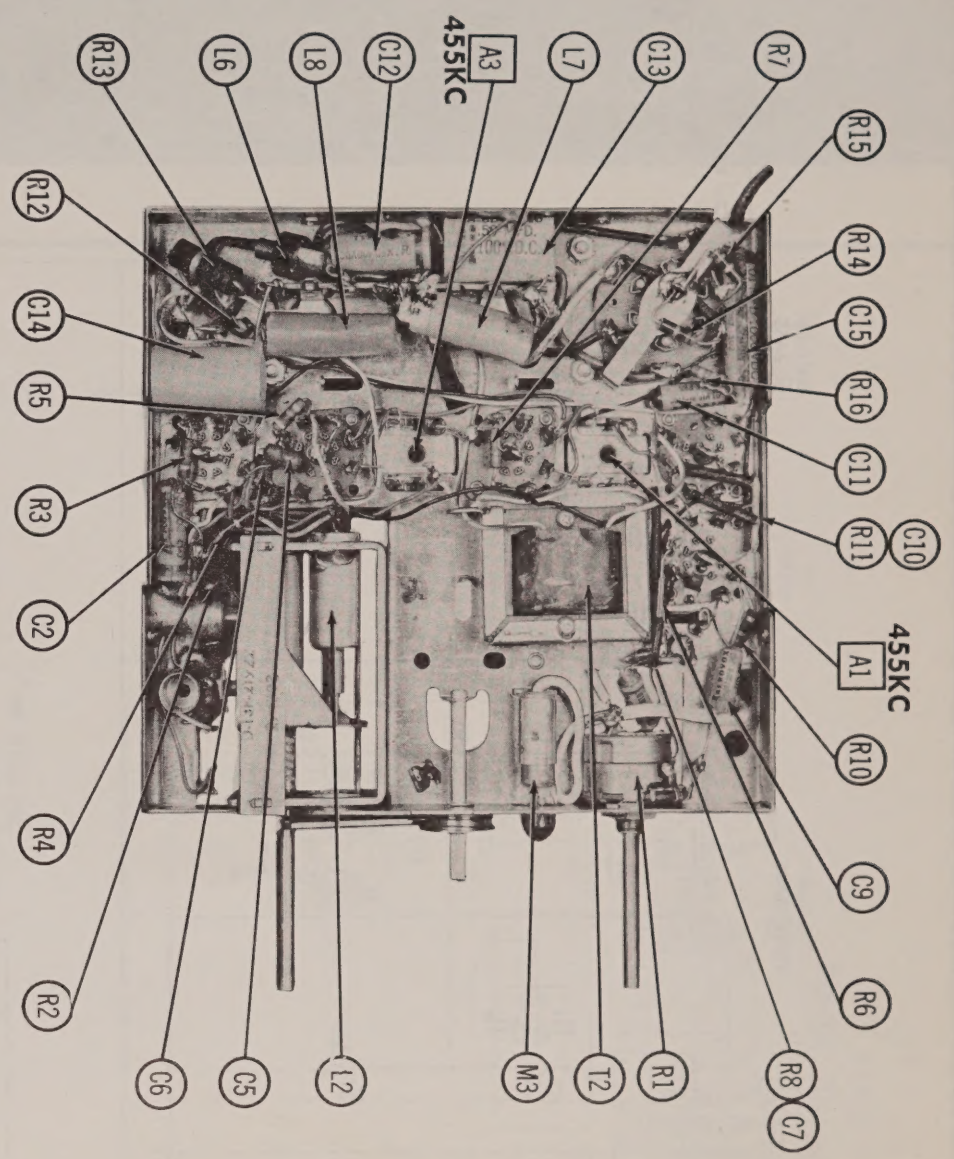
SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	AIRLINE PART No.	VIKING PART No.	QUAM PART No.	
SP1	4"X6"	PM	3. 3Ω	18A22125	46J6	46A07	

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	AIRLINE PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Ant. Coil	12Ω						Part of tuning Assembly; assembly Part # 13F-21922
L2	RF Coil	12Ω						Part of tuning assembly
L3	Osc. Coil	. 5Ω	5Ω					Part of tuning assembly
L4	Input IF	15Ω	15Ω	13B-17731	16-6758	BC-352	12-C1	
L5	Output IF	15Ω	15Ω	13B-17731	16-6758	BC-353	12-C2	
L6	RF Filter Choke	11Ω		201-22128	19-3660	TV-188	4650	590 Microhenries
L7	Vibrator Hash Choke	0Ω		16M-19921			5221	2. 5Microhenries
L8	Fil. Choke	0Ω		16M-19921			5221	2. 5 Microhenries

CHASSIS—BOTTOM VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

VIBRATOR

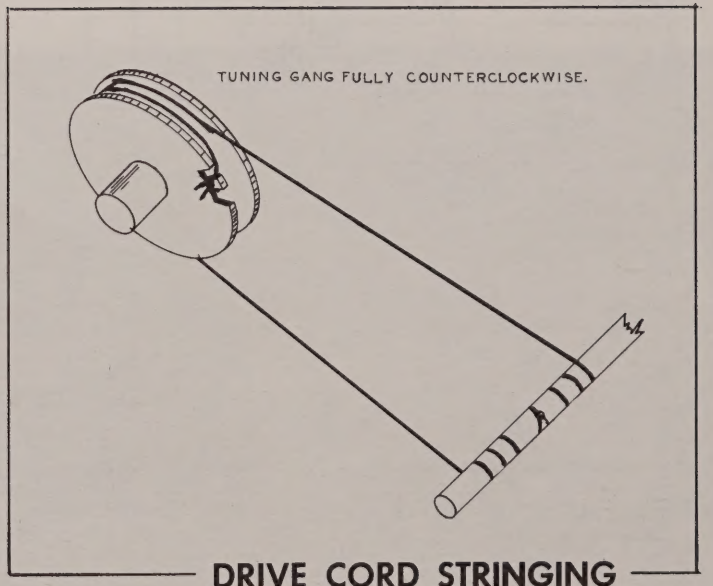
ITEM No.	TYPE	INPUT VOLTS	FREQUENCY	REPLACEMENT DATA				NOTES
				AIRLINE PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	RADIART PART No.	
M1	Synchronous	6.3V	115	21A-21732	5454	742	5454	

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			AIRLINE PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M2	SFE	14A	46B-17993		307014. (SFE-14A)	155014	SFE14	HDI

MISCELLANEOUS

ITEM No.	PART NAME	AIRLINE PART No.	NOTES
M3	Dial light	46A-11739	# 44 bayonet
	Trimmer cap	8E-21728	(3) used
	Dial scale	5M-21796	
	Knob	4B-21985-A117	(2) used



DRIVE CORD STRINGING

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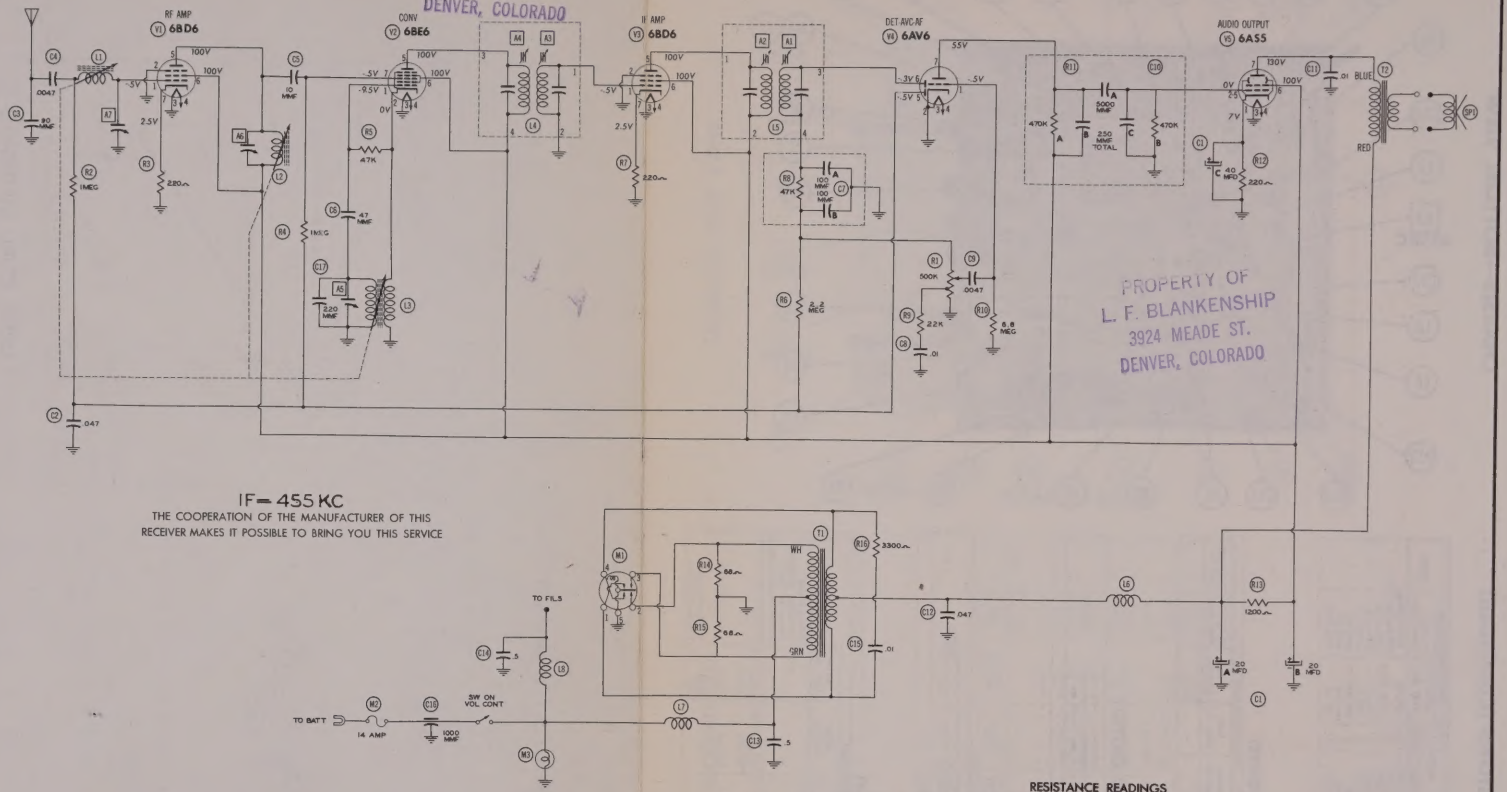
3924 MEADE ST.
DENVER, COLORADO



IF = 455 KC

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Battery voltage maintained at 6.3 volts for voltage readings.
5. Nominal tolerance on components values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	6BD6	3.7Meg	0Ω	0Ω	.5Ω	†1.2KΩ	†1.2KΩ	220Ω
V 2	6BE6	47KΩ	.5Ω	0Ω	.5Ω	†1.2KΩ	†1.2KΩ	3.7Meg
V 3	6BD6	15Ω	0Ω	0Ω	.5Ω	†1.2KΩ	†1.2KΩ	220Ω
V 4	6AV6	6.8Meg	0Ω	0Ω	.5Ω	550KΩ	2.7Meg	†470KΩ
V 5	6AS5	220Ω	470KΩ	0Ω	.5Ω	470KΩ	†1.2KΩ	†310Ω

† MEASURED FROM CENTER TAP OF T1

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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AIRLINE MODELS 35GSE-3076A, 35GSE-3078A, 35GSE-3095A, 35GSE-3097A

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Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.

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3324 MEADE ST
DENVER, COLORADO

MODEL 35GSE-3076A

AIRLINE MODELS 35GSE-3076A, 35GSE-3078A, 35GSE-3095A, 35GSE-3097A

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DATE 5-54 SET 238 FOLDER 3

PHOTOFACT* Folder

AIRLINE MODELS 35GSE-3076A, 35GSE-3078A, 35GSE-3095A, 35GSE-3097A

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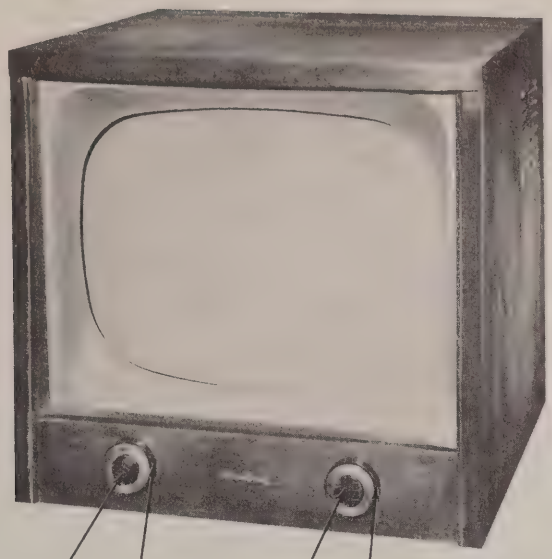

AIRLINE MODEL 35GSE-3076A

TRADE NAME	Airline Models 35GSE-3076A, 35GSE-3078A, 35GSE-3095A, 35GSE-3097A
SUPPLIER	Montgomery Ward & Co., 619 Chicago Ave., Chicago, Ill.
TYPE SET	Television Receiver
TUBES	Eighteen
POWER SUPPLY	110-120 Volts AC-60 cycle RATING 1.48 Amp. @ 117 Volts
TUNING RANGE	Channels 2 thru 13, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)

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AIRLINE MODELS 35GSE-3076A, 35GSE-3078A, 35GSE-3095A, 35GSE-3097A

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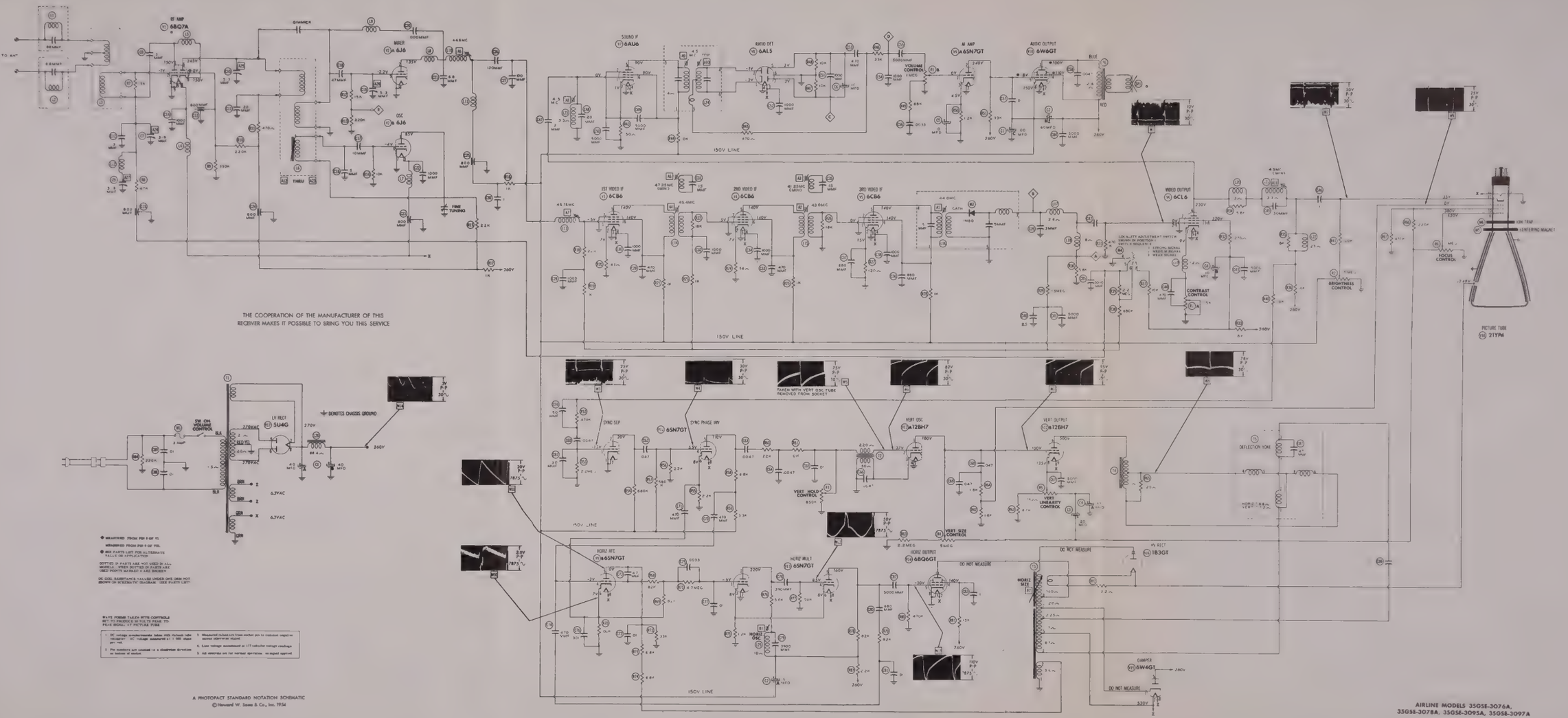
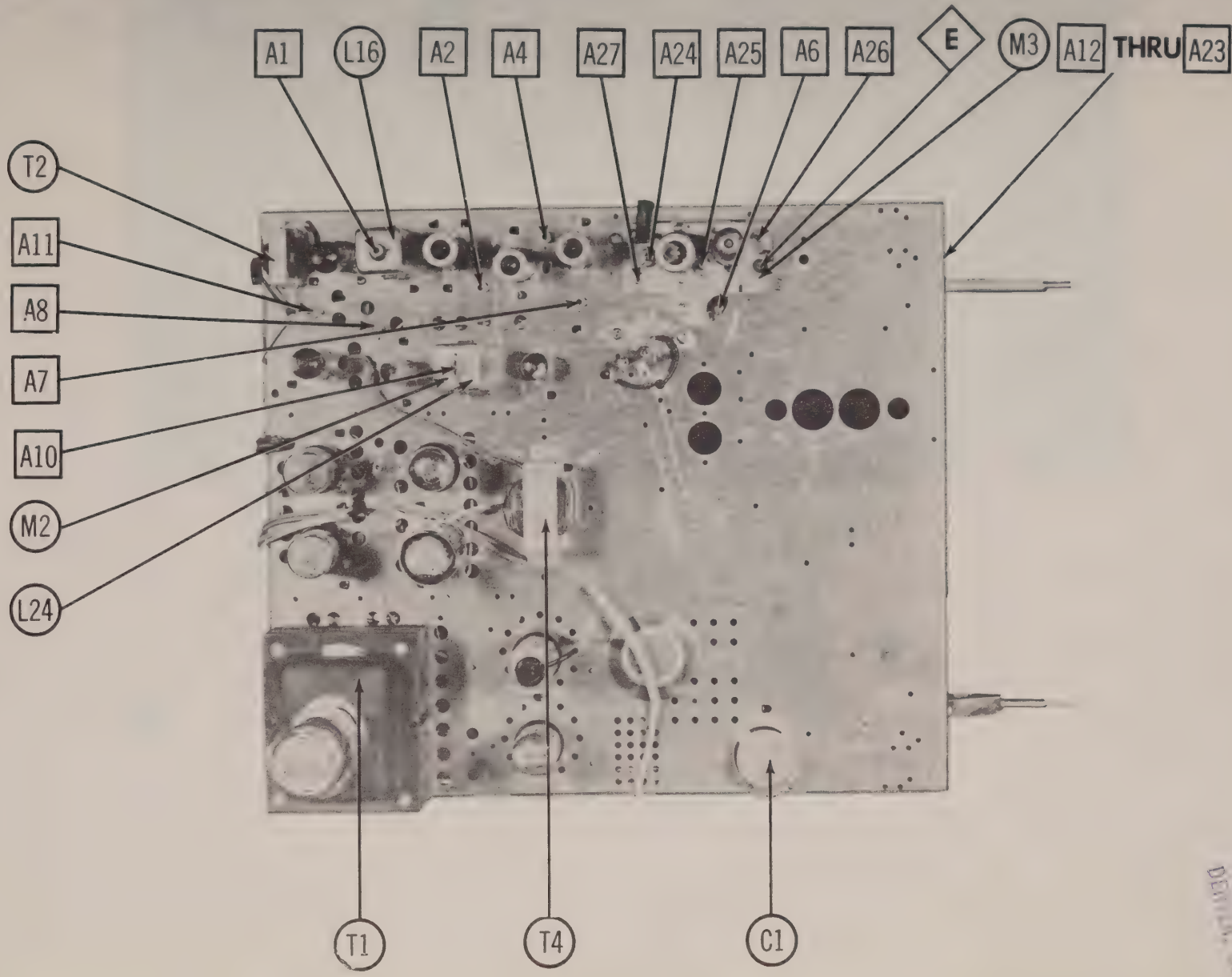
DATE 5-54 SET 238 FOLDER 3



AIRLINE MODELS 35GSE-3076A, 35GSE-3078A, 35GSE-3095A, 35GSE-3097A



CHASSIS TOP VIEW

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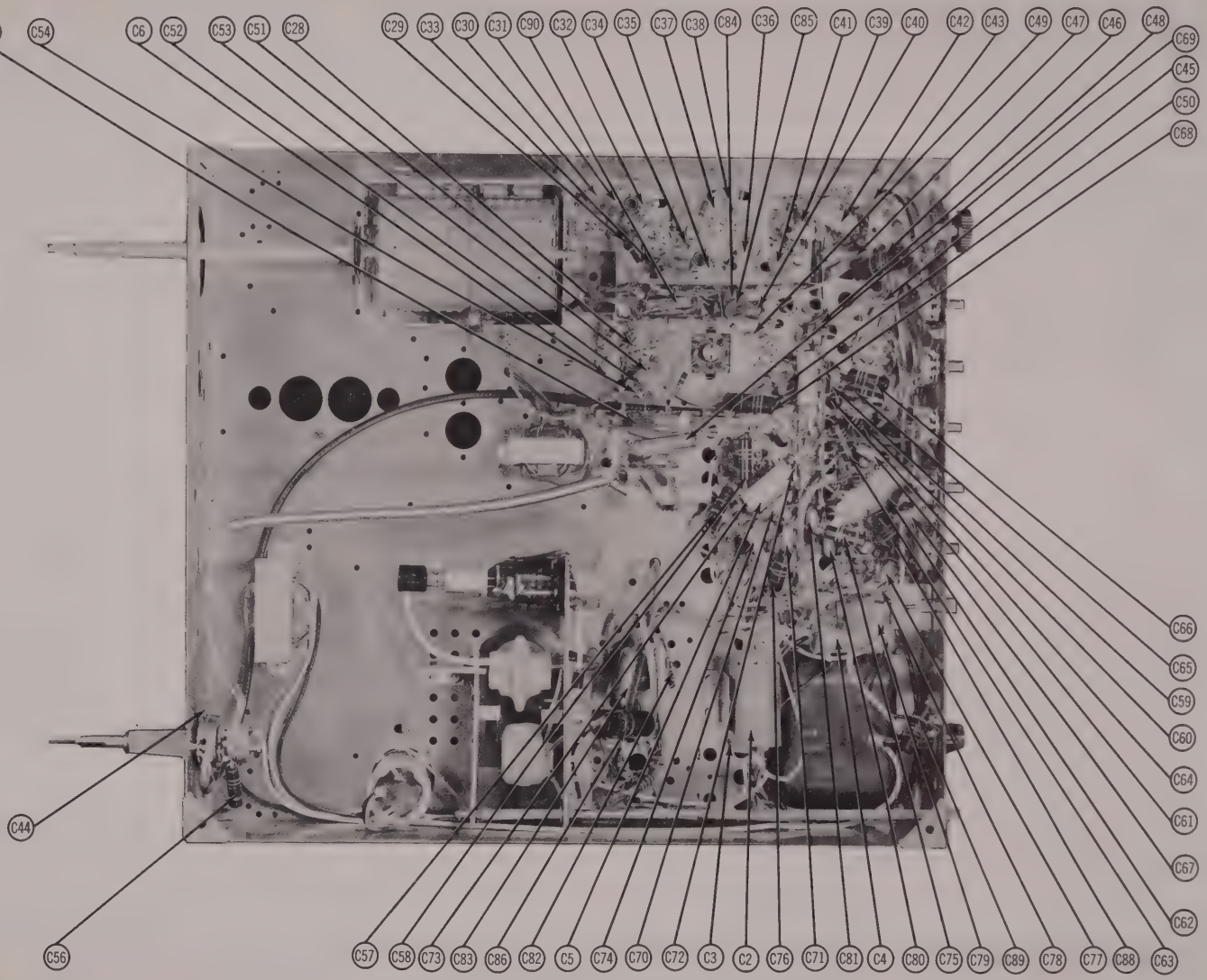
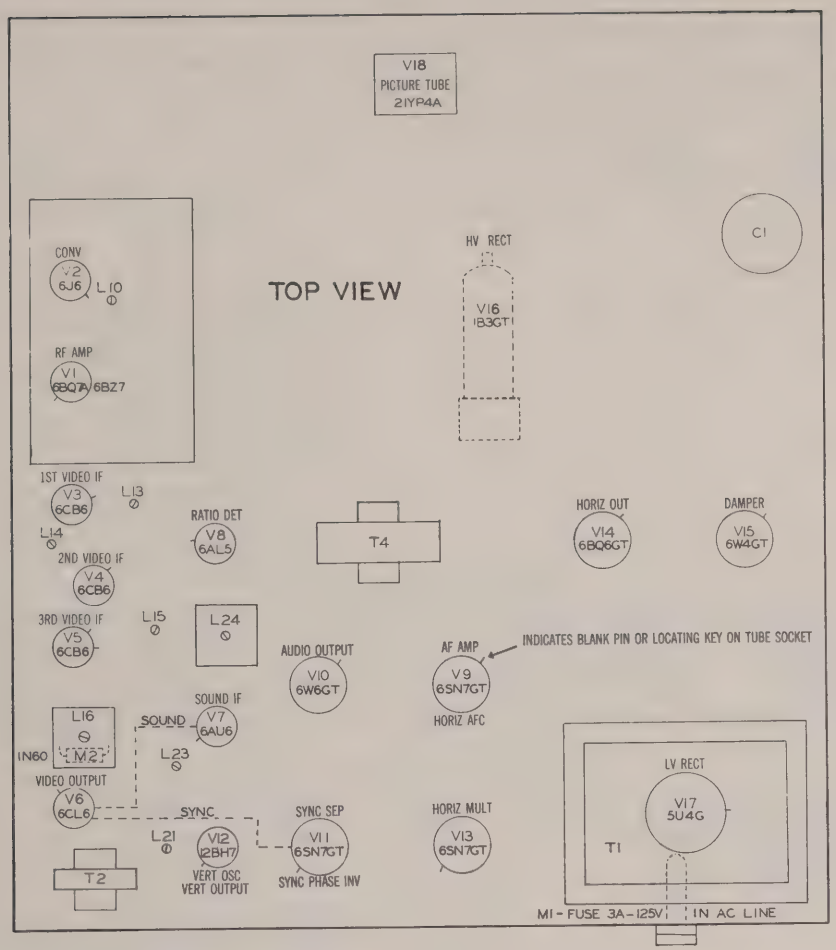


CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION

PROPERTY OF
L. [illegible] SHIP
[illegible] ST.
DENVER, COLORADO

TUBE PLACEMENT CHART

PROPERTY OF
L. F. BLANKENSHIP
3020 MEADE ST
DENVER, COLORADO



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - V17, Fuse (M1)

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - V2, V3, V4, V5, V6, V10
No pic, no sound, has snow - V1, V2, V3
No pic, has sound, has raster - V6, V18
Has pic, no sound - V7, V8, V9, V10

SYNC FAILURE
No vert. sync - V11, V12
No horiz. sync - V9, V11, V13
No vert. or horiz. sync - V11

SWEEP FAILURE
No raster, has sound - V13, V14, V15, V16, V18
No vertical deflection - V12
Poor vert. linearity or foldover - V12
Poor horiz. linearity or foldover -V13, V14. V15
Narrow picture - V13, V14, V15, V16, V17
Vert. off freq. - V11, V12
Horiz. off freq. - V9, V11, V13

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage lead should be securely taped and kept away from the chassis. Do not remove the horizontal oscillator tube (V13) to disable the high voltage. Allow ½ hour warm-up period for receiver and test equipment.

VIDEO IF ALIGNMENT

Remove the converter tube (V2) and replace with a 6J6 which has pin 1 removed. This will disable the local oscillator and reduce the possibility of erroneous indications.
Connect the negative lead of a 3 volt battery to the ungrounded side of C40. Connect the positive lead to chassis.
Set the "locality adjuster" switch (rear panel) to "strong signal" position.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to an ungrounded tube shield floating over dummy converter tube. Low side to chassis.	44.0MC (Unmod)	Any	DC probe thru 47KΩ to point (A). Common to chassis.	A1	Adjust for maximum deflection. Attenuate signal generator to maintain not more than 2 volts at VTVM.
2.	"	"	43.0MC	"	"	A2	"
3.	"	"	41.25MC	"	"	A3	Adjust for MINIMUM deflection. Repeat steps 2 and 3.
4.	"	"	45.4MC	"	"	A4	Adjust for maximum deflection. Attenuate signal generator to maintain not more than 2 volts at VTVM.
5.	"	"	47.25MC	"	"	A5	Adjust for MINIMUM deflection. Repeat steps 4 and 5.
6.	"	"	44.6MC	"	"	A6	Detune A7 by turning slug out of coil as far as possible. Adjust A6 for maximum deflection.
7.	"	"	45.75MC	"	"	A7	Adjust for maximum deflection. Attenuate signal generator to maintain not more than 2 volts at VTVM.

OVERALL VIDEO IF RESPONSE CHECK

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
8.	Direct	High side to an ungrounded tube shield floating over dummy converter tube. Low side to chassis.	44MC (10MC Swp)	41.25MC 42.25MC 45.75MC 47.25MC	Any	Vert. Amp. thru 47KΩ to point (A). Low side to chassis.		Check for response similar to Fig. 1. If necessary, retouch A1, A2, A4, A6 and A7 to obtain desired response.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Remove third video IF amplifier tube (V5) from its socket. Set contrast control to maximum contrast position.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
9.	.001MFD	High side to point (B). Low side to chassis.	4.5MC (Unmod)	Any	DC probe thru 47KΩ to point (C). Common to chassis.	A8, A9	Adjust for maximum deflection.
10.	"	"	"	"	DC probe thru 47KΩ to point (D). Common to chassis.	A10	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting. Replace V5 in its socket.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Remove third video IF amplifier tube (V5) from its socket. Set contrast control to maximum contrast position.
Use frequency modulated signal with 60% modulation and 450KC sweep. Use 120% sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
9.	.001MFD	High side to point (B). Low side to chassis.	4.5MC (450KC Swp)	4.5MC	Any	Vert. Amp. thru 47KΩ to point (C). Low side to chassis.	A8, A9	Disconnect stabilizing capacitor C6. Adjust for curve of maximum amplitude and symmetry similar to Fig. 2.
10.	"	"	"	"	"	Vert. Amp. thru 47KΩ to point (D). Low side to chassis.	A10	Reconnect stabilizing capacitor C6. Adjust so that 4.5MC occurs at center of crossover lines as in Fig. 3. SLIGHTLY retouch A9 for maximum amplitude and straightness of crossover lines. Replace V5 in its socket.

4.5MC TRAP ALIGNMENT

Remove V5 from its socket.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
11.	.001MFD	High side to pin 11 of picture tube. Low side to chassis.	4.5MC (Unmod)	Any	DC probe thru 47KΩ to point (C). Common to chassis.	A11	Adjust for MINIMUM deflection. Replace V5 in its socket.

ALTERNATE 4.5MC TRAP ALIGNMENT

Tune in the strongest TV station available and adjust A-11 for minimum 4.5MC beat in picture.

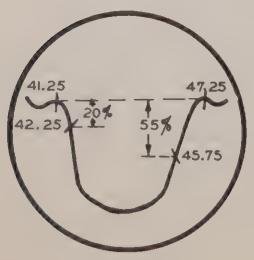


FIG.1

FIG.2

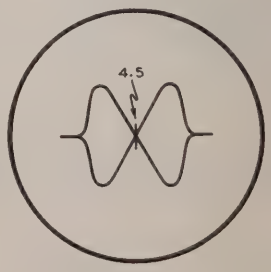


FIG.3

ALIGNMENT INSTRUCTIONS (cont)

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L F RADIO SHOP
DENVER, COLORADO

OSCILLATOR ALIGNMENT

Remove the dummy converter tube and replace the original 6J6 in its socket.
The channel oscillator adjustment screws are reached thru a hole just to the right of the channel switch shaft. The correct adjustment screw is accessible thru this hole as the channel switch is turned to each channel.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
12.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	211.25MC 215.75MC	13	Vert. Amp. thru 47KΩ to point (A). Low side to chassis	A12	Adjust to place sound marker in trap notch as in Fig. 4. Video marker should be at 55%.
			207MC (10MC Swp)	205.25MC 209.75MC	12		A13	
			201MC (10MC Swp)	199.25MC 203.75MC	11		A14	
			195MC (10MC Swp)	193.25MC 197.75MC	10		A15	
			189MC (10MC Swp)	187.25MC 191.75MC	9		A16	
			183MC (10MC Swp)	181.25MC 185.75MC	8		A17	
			177MC (10MC Swp)	175.25MC 179.75MC	7		A18	
			85MC (10MC Swp)	83.25MC 87.75MC	6		A19	
			79MC (10MC Swp)	77.25MC 81.75MC	5		A20	
			69MC (10MC Swp)	67.25MC 71.75MC	4		A21	
			63MC (10MC Swp)	61.25MC 65.75MC	3		A22	
			57MC (10MC Swp)	55.25MC 59.75MC	2		A23	

RF AND MIXER ALIGNMENT

Leave bias connected as under "Video IF Alignment"
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
13.	Two 120Ω carbon resistors	Across antenna terminals with 120Ω in each lead	207MC (20MC Swp)	205.25MC 209.75MC	12	Vert. amp. thru 10KΩ to point (E). Low side to chassis.	A24,A25 A26	Adjust for response similar to Fig. 5.
14.	"	"	213MC (20MC Swp)	211.25MC 215.75MC	13	"		Check for response similar to Fig. 5. If markers fall below 70% on any channel make compromise adjustment of A24, A25 and A26 with channel switch set to that channel the recheck all other channels to see that they have not been seriously affected.
			201MC (20MC Swp)	199.25MC 203.75MC	11			
			195MC (20MC Swp)	193.25MC 197.75MC	10			
			189MC (20MC Swp)	187.25MC 191.75MC	9			
			183MC (20MC Swp)	181.25MC 185.75MC	8			
			177MC (20MC Swp)	175.25MC 179.75MC	7			
			85MC (20MC Swp)	83.25MC 87.75MC	6			
			79MC (20MC Swp)	77.25MC 81.75MC	5			
			69MC (20MC Swp)	67.25MC 71.75MC	4			
			63MC (20MC Swp)	61.25MC 65.75MC	3			
			57MC (20MC Swp)	51.25MC 55.75MC	2			

40MC TRAP ALIGNMENT

A27 will require adjustment only when local interference in the 40 to 45MC range occurs.
Tune in the station on which interference occurs and adjust A27 for minimum 40MC beat in picture.

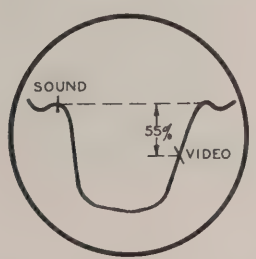


FIG. 4

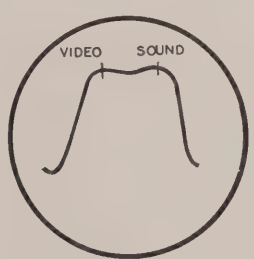
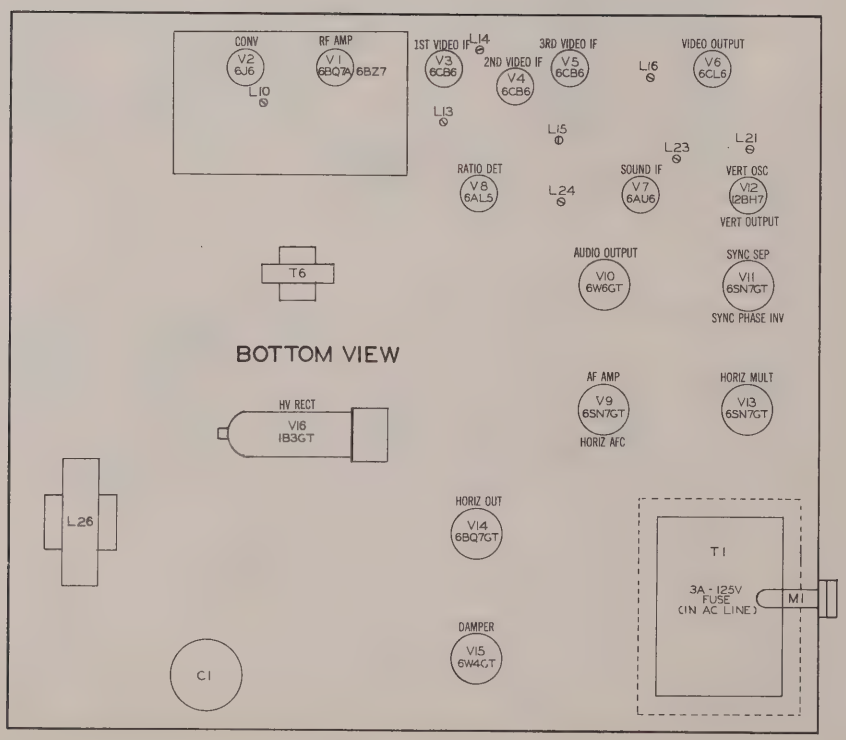


FIG. 5

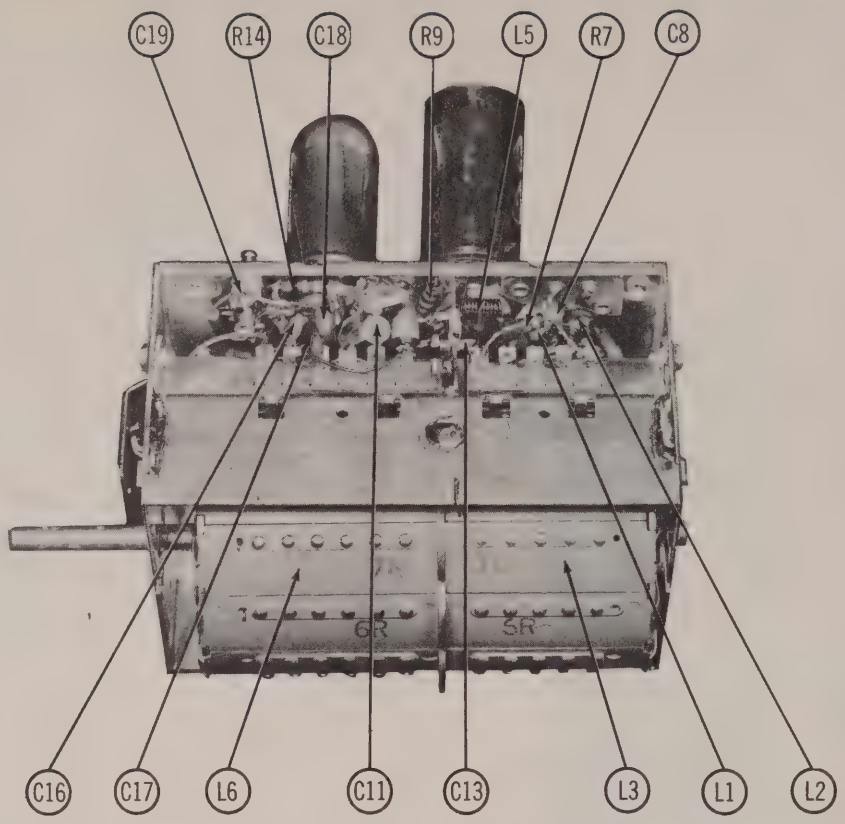
RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BK7	INF	4.4Meg	0Ω	.1Ω	0Ω	†1.5KΩ	150KΩ	INF	0Ω
V 2	6J6	†23KΩ	▲1KΩ	.1Ω	0Ω	235KΩ	10KΩ	0Ω		
V 3	6CB6	1.5Meg	47Ω	0Ω	.1Ω	▲1KΩ	▲1KΩ	0Ω		
V 4	6CB6	1.5Meg	56Ω	0Ω	.1Ω	▲1KΩ	▲1KΩ	0Ω		
V 5	6CB6	.1Ω	120Ω	0Ω	.1Ω	▲1KΩ	▲1KΩ	0Ω		
V 6	6CL6	900Ω	470KΩ	†18KΩ	.1Ω	0Ω	†4.1KΩ	0Ω	†18KΩ	470KΩ
V 7	6AU6	3.5Ω	150Ω	0Ω	.1Ω	▲10KΩ	▲10KΩ	150Ω		
V 8	6AL5	INF	INF	.1Ω	0Ω	10KΩ	0Ω	10KΩ		
V 9	6SN7GT	1Meg	†33KΩ	1.2KΩ	265KΩ	10KΩ	100KΩ	0Ω	.1Ω	
V 10	6W6GT	INF	.1Ω	†285Ω	†65Ω	†33KΩ	INF	0Ω	50KΩ	
V 11	6SN7GT	2.2Meg	▲680KΩ	0Ω	22KΩ	▲10KΩ	2.2KΩ	0Ω	.1Ω	
V 12	12BH7	▲1.7Meg	600KΩ	50Ω	0Ω	0Ω	▲23Ω	▲1.7KΩ	9.5KΩ	.1Ω
V 13	6SN7GT	4.9Meg	†8KΩ	1.2KΩ	150KΩ	†85KΩ	1.2KΩ	0Ω	.1Ω	
V 14	6BQ6GT	INF	.1Ω	INF	†15KΩ	470KΩ	†85KΩ	0Ω	0Ω	TOP CAP ▲20Ω
V 15	6W4GT	INF	INF	350KΩ	▲70Ω	†65Ω	10KΩ	▲20Ω	▲20Ω	
V 16	1B3GT		PINS	1 - 8	HAVE	INF	RESISTANCE			TOP CAP ▲360Ω
V 17	5U4G	INF	45KΩ	INF	21Ω	INF	20Ω	INF	45KΩ	
V 18	21YP4	0Ω	1.8KΩ	PIN 6 ▲6KΩ	PIN 10 ▲220KΩ	PIN 11 370KΩ	PIN 12 .1Ω			

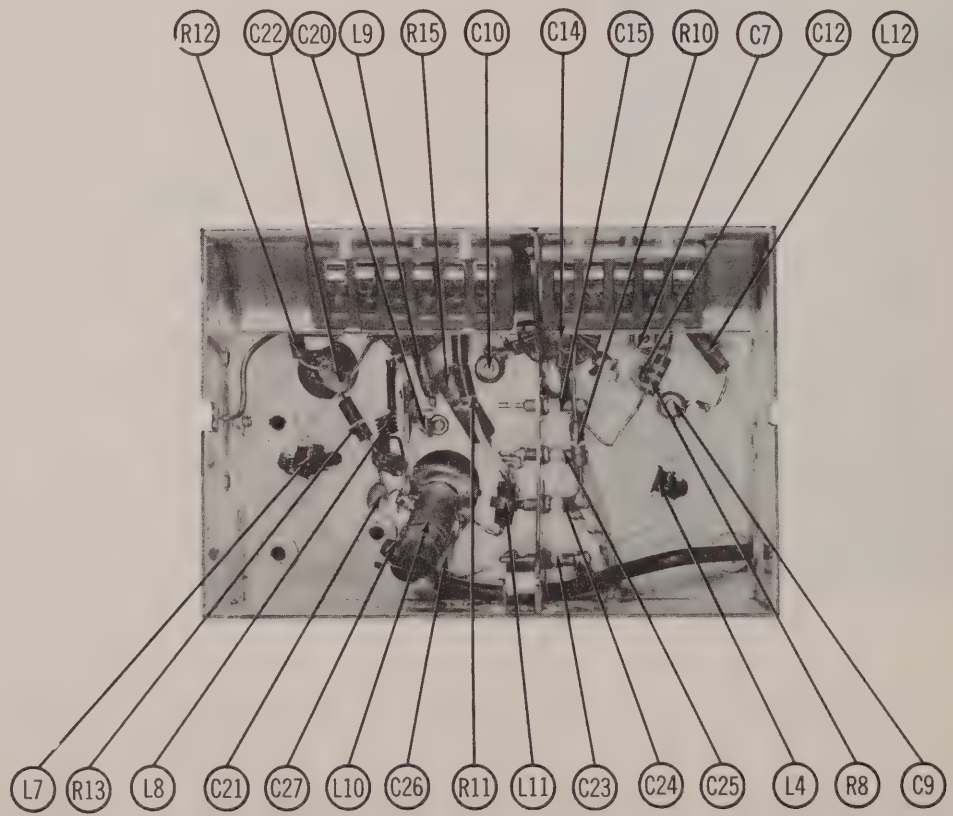
† MEASURED FROM PIN 8 OF V17.
▲ MEASURED FROM PIN 8 OF V10.
▲ MEASURED FROM PIN 3 OF V15.



TUBE PLACEMENT CHART

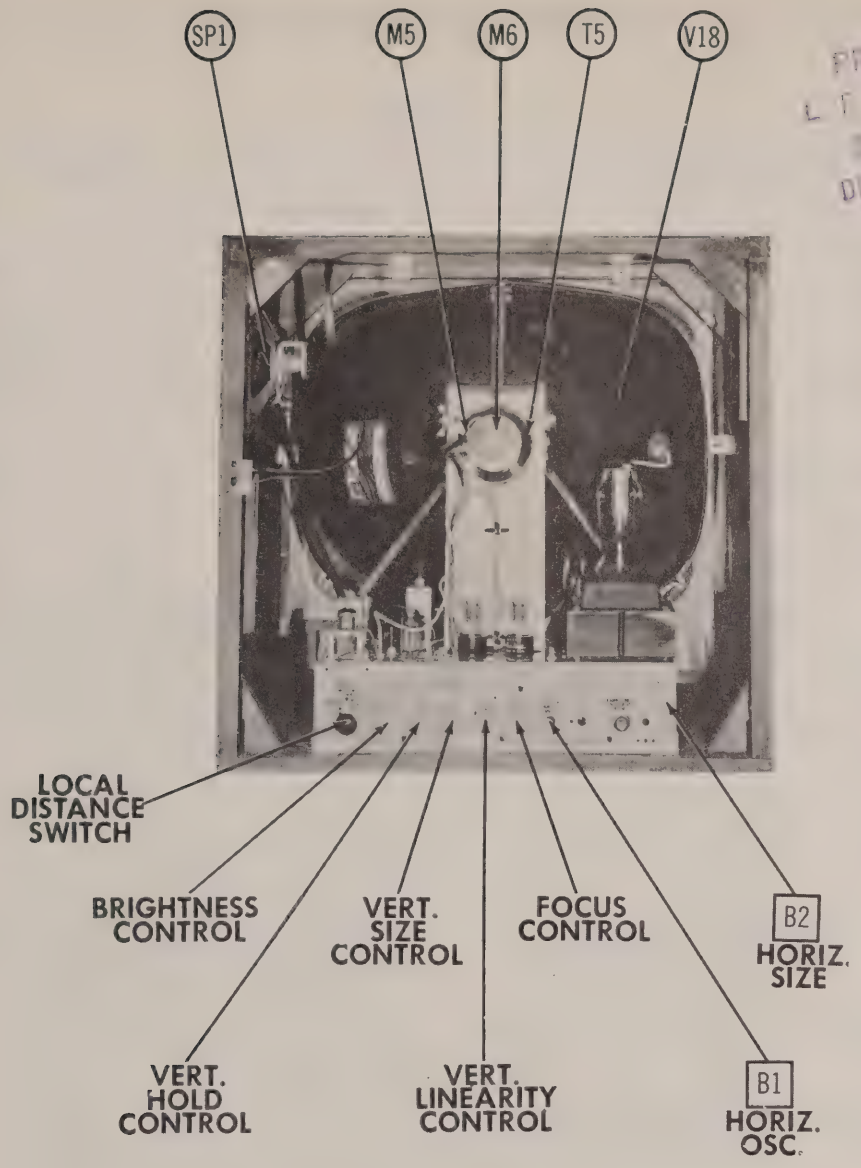


RF TUNER-RIGHT SIDE



RF TUNER-BOTTOM VIEW

PROPERTY OF
L T [illegible] MUSEUM
[illegible] MEADE ST.
DENVER, COLORADO



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.

Adjust the horizontal oscillator slug (B1) until the picture synchronizes horizontally.

Set the horizontal size adjustment (B2) for a picture that is slightly wider than necessary to fill the picture mask horizontally.

TROUBLE SHOOTING AIDS

SWEEP

HORIZONTAL

LOSS OF SWEEP

Follow procedure outlined under "Loss of High Voltage".

INSUFFICIENT SWEEP

Check by substitution V13, V14, V15, and V17. Check adjustment B2. Check waveform W13.

If Satisfactory	If Unsatisfactory
Check T3, T5A, C83, C86, R81 and other associated components.	Check R80, C82 and other associated circuit components.

DRIVE LINES

Check by substitution V13, V14 and V15. Check C82, R80, C80, R79, T3, T5A, C87 and other associated circuit components for failure or change of value.

COMPRESSED LEFT SIDE

Check by substitution V14 and V15. Check adjustment B2. Check components associated with the horizontal output and damper stages, especially T3 and T5A.

FOLDS

Follow procedure outlined under "Drive Lines".

PIE CRUST EFFECT

Check by substitution V13, V14 and V15. Check C77 for open. Check T3, T5A and other associated components.

XMAS TREE EFFECT

Substitute V13. Check C78, C79, L25 and other associated components.

VERTICAL

LOSS OF SWEEP

Substitute V12. Check waveform W7.

If Satisfactory	If Unsatisfactory
Check T4, T5B and other associated components.	Check T2, R4, C66 and other associated components.

INSUFFICIENT SWEEP

Check adjustment of height and vertical linearity controls. Proceed as outlined under "Loss of Sweep".

COMPRESSED AT BOTTOM

Substitute V12. Check T4, T5B, C67, C4A and other associated components.

COMPRESSED AT TOP

Substitute V12. Check T2, C68, C69 and other associated components.

FOLDS

Substitute V12. Check T2, T4, T5B, C67, C68 and other associated circuit components for failure or change of value.

SYNC

LOSS OF VERTICAL AND HORIZONTAL SYNC

Substitute V11. Check C60, C62, R53, R54, R56 and other associated components.

LOSS OF VERTICAL SYNC-HORIZONTAL SYNC SATISFACTORY

Check by substitution V11 and V12. Check waveform W5.

If Satisfactory	If Unsatisfactory
Check components associated with V12A especially T2, C65, C66 and R3.	Check R60, R61, C63, C64 and other associated components.

LOSS OF HORIZONTAL SYNC-VERTICAL SYNC SATISFACTORY

Chech by substitution V9 and V13. Check components associated with V9B and V13 especially C72, C73, C74, C78, C79, L25, R68, R69, R72, R73, R74, R70 and R77.

HORIZONTAL BENDING

Check by substitution V9, V13 and V 14. Check horizontal AFC filter network components.

VIDEO

LOSS OF VIDEO

Check C46, picture tube and other associated components.

SOUND BARS (4.5MC BEAT)

Adjust tuner fine tuning for best picture and sound. Check adjustment A11. Check video IF alignment.

POOR CONTRAST

Substitute V6. Check video detector assembly. Check C46, contrast control, picture tube and other associated components.

NEGATIVE PICTURE

Check by substitution V1, V3, V4, V5 and V6. Check video detector crystal. Check video IF components.

SMEAR

Substitute V6. Check video detector crystal and assembly. Check V1, V3, V4 and V5. Check C46, C42, L20, L22, L17, L18, R33, R36, R41, picture tube and other components for failure or change of value.

WIDE BLACK BAR ACROSS PICTURE

Check V1, V3, V4, V5 and V6 for heater to cathode leakage. Check B+ filter capacitors for open.

AUDIO

WEAK OR NO SOUND

Check by substitution V7, V8, V9 and V10. Check stages V9A and V10 using audio signal generator. Apply audio signal across R1B.

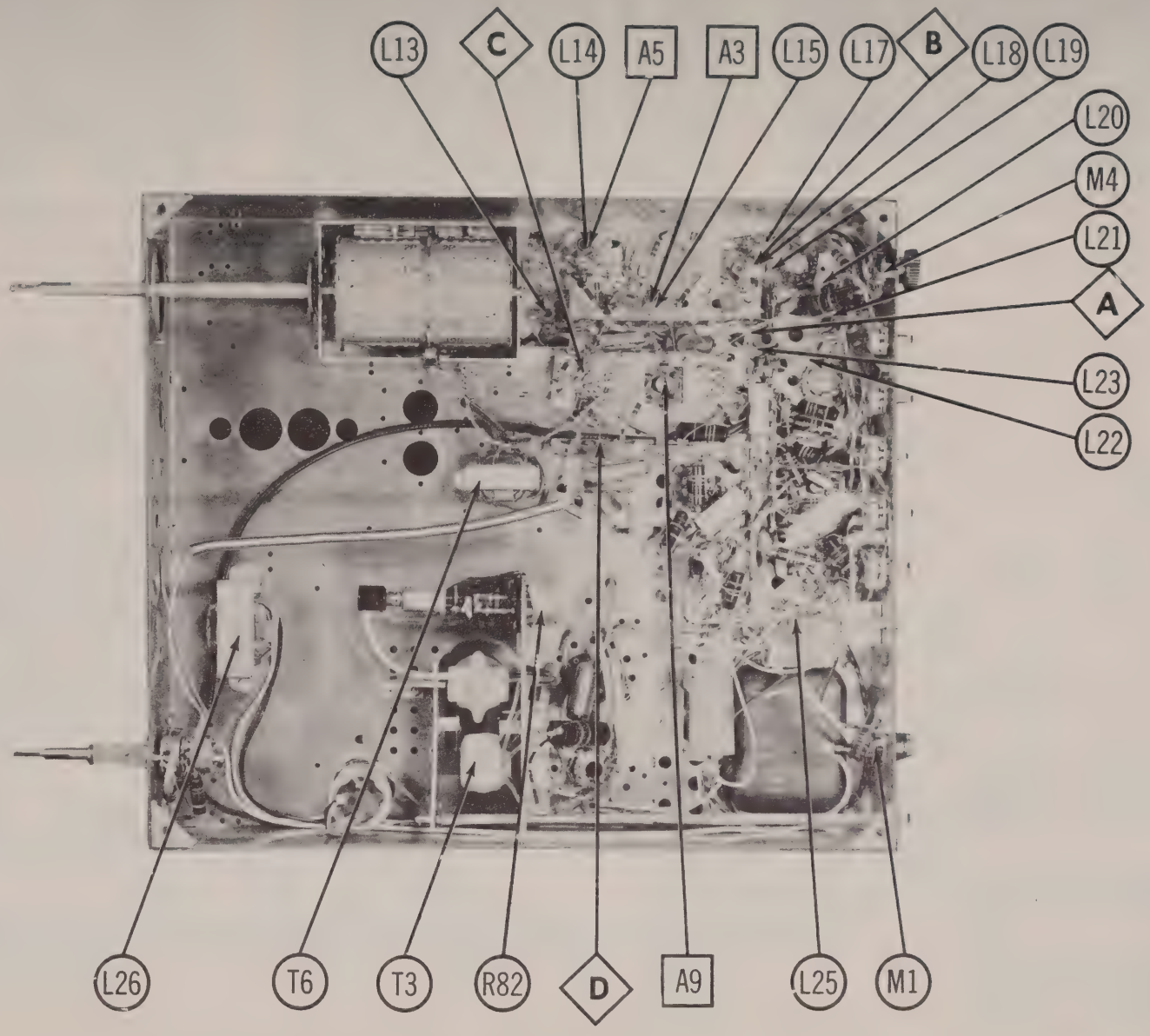
If Satisfactory	If Unsatisfactory
Check Ratio detector and audio IF alignment and components.	Check components associated with V9A and V10.

BUZZ

Adjust tuner fine tuning for best picture and sound. Adjust A10 for minimum buzz. If still unsatisfactory substitute V8 and realign ratio detector and audio IF stages.

DISTORTED

Follow procedure outlined under "Weak or No Sound".



CHASSIS BOTTOM VIEW-TRANS., INDUCTOR AND ALIGNMENT IDENTIFICATION

PROPERTY OF
L. F. BLANKENSHIP
3920 MEADE ST.
DENVER, COLORADO

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No	USE	REPLACEMENT DATA: AIRLINE PART No.	STANDARD REPLACEMENT	RETMA BASE TYPE	NOTES
V1A	RF Amplifier	6BQ7A	6BQ7A	9AJ	
B	RF Amplifier	6BS7	6BS7	9AJ	
V2	Converter	6J6	6J6	7BF	
V3	1st Video IF Amp.	6CB6	6CB6	7CM	
V4	2nd Video IF Amp.	6CB6	6CB6	7CM	
V5	3rd Video IF Amp.	6CB6	6CB6	7CM	
V6	Video Output	6CL6	6CL6	6CL6	
V7	Sound IF Amp.	6AU6	6AU6	7BK	
V8	Ratio Detector	6AL5	6AL5	6BT	
V9	AF Amplifier - Horiz. AFC	6BN7GT	6BN7GT	8BD	
V10	Audio Output	6W6GT	6W6GT	7S	
V11	Sync Separator- Sync Phase Inv.	6BN7GT	6BN7GT	8BD	
V12	Vert. Oscillator- Vert. Output	12BH7	12BH7	9A	
V13	Horiz. Mult	6BN7GT	6BN7GT	8BD	
V14	Horiz. Output	6BQ6GT	6BQ6GT	8AM	
V15	Damper	6W6GT	6W6GT	4CG	
V16	HV Rectifier	1B3GT	1B3GT	3C	
V17	LV Rectifier	5U4G	5U4G	4T	

CATHODE-RAY TUBE

ITEM No	AIRLINE PART No	SYLVANIA PART No.	GENERAL ELECTRIC PART No.	WESTINGHOUSE PART No.	RETMA BASE TYPE	NOTES
V18	21VP4	21VP4 21VP4A 21AFP4 ①	21VP4 21VP4A	21VP4 21VP4A	12-L 12-L 12M	① Circuit changes necessary

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	AIRLINE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	±40	350	25E65	AFH3-459		C118		FP375	TVL-3764	
B	±40	350								
C	±100	200								
C2A	5	250	25E53	PR8450/80		BR3025		TC56	R1291	
B	60	250		PR8250/4		BR425		TC50X		Red
C3	20	450	25E64	PR8450/30		BR1045		TC76	TVA-1709	
C4A	30	200	25E63	PR8450/30		BR3025		TC77	TVA-1510	Red
B	10	350		PR8350/10		BR1235		TC62	TVA-1504	
C5	10	50	25E66	PR8250/9		BR105		TC32	TVA-1504	
C6	10	50	25E66	PR850/10		BR105		TC32	TVA-1504	
C7	5-9		21B-167		529-10					
C8	3		CD8C-030C	SI3NP0		Z007	NP0-831-3	ZT-553	5TCCB-V3	
C9	5-9		21B-167		529-10					
C10	.5-3		21B-206		529-3		3115-01-0R5	CT565A		
C11	120		CD8D-121K	BPD-00012	D8-102	G044	GPIK-121	UC-5312	5GA-T12	
C12	3		CD8C-030C	SI3NP0		Z007	NP0-831-3	ZT-553	5TCCB-V3	
C13	800		31B-611	EF-001	MFT-1000				503C-D1	
C14	1000		CD8X-102Z	BPD-001	DD-103	K069	801-001	DC-521	5HK-D1	
C15	800		31B-611	EF-001	MFT-1000				503C-D1	
C16	5		CD8UA-050C							
C17	10		CD8C-100K	SI3NP0	TCZ-10	Z018	NP0K-100	ZT-541	5TCC-Q1	
C18	47		CD8Q-470K	BPD-000047	D8-470	G033	801-470	UC-5447	5GA-Q47	
C19	.5-3		21B-206		529-3		3115-01-0R5	CT565A		
C20	1000		CD8X-102Z	BPD-001	DD-103	K069	801-001	DC-521	5HK-D1	
C21	6.8		12L8C8S8C	SI6.8NP0	TCZ-6.8	Z013	NP0K-6R8	ZT-5568	5TCCB-V68	
C22	1000		CD8X-102Z	BPD-001	DD-103	K069	801-001	DC-521	5HK-D1	
C23	800		31B-611	EF-001	MFT-1000				503C-D1	
C24	800		31B-611	EF-001	MFT-1000				503C-D1	
C25	800		31B-611	EF-001	MFT-1000				503C-D1	
C26	150		12L8D12K	BPD-00013	D8-150	G044	GPIK-121	UC-5313	5GA-T13	
C27	100		12KR1-30U10J	SI100NT50	TCN-100	TN23	NT50L-101	NT-531	5TCU-T1	
C28	1000		12K2R2S-3	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C29	470		12K2G7-14	SI470	D8-471	TP46	GP2K-471	UC-5347	5GA-T47	
C30	1000		23K2025-3	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C31	15			SI15	D8-150	TP11	GPIK-150	UC-5415	5GA-Q15	
C32	1000		23K2025-3	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C33	470		23K2027-14	SI470	D8-471	TP46	GP2K-471	UC-5347	5GA-T47	
C34	1000		23K2025-3	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C35	15			SI15	D8-150	TP11	GPIK-150	UC-5415	5GA-Q15	
C36	680		23K2027-11	SI680	D8-681	TP50	GP2K-681	UC-5368	5GA-T68	
C37	680		23K2027-11	SI680	D8-681	TP50	GP2K-681	UC-5368	5GA-T68	
C38	1000		23K2025-3	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C39	3		23K20	SI3NP0		Z007	NP0-831-3	ZT-553	5TCCB-V3	
C40	.25	100	23K122	P288-25		CUB2P25		PT4025	2TM-P25	
C41	5000		23K2025	BPD-005	DD-502	K080	801-005	DC-525	5HK-D5	
C42	.1	200	23K3216	P288-1	DF-104	CUB2P1		PT401	2TM-P1	
C43	5000		23K2025	BPD-005	DD-502	K080	801-005	DC-525	5HK-D5	
C44	470		23K2027-14	SI470	D8-471	TP46	GP2K-471	UC-5347	5GA-T47	
C45	30		23K23	SI30	D8-300	TZ17	GPIK-300		5GA-Q3	
C46	.1	400	23K3416	P488-1	DF-104	CUB4P1		PT401	4TM-P1	
C47	5		23K21		TCZ-5.2	TZ05			5TCCB-V22	
C48	20		23K22	SI20NP0	TCZ-20	TZ13	NP0K-200	ZT-543	5TCC-Q3	
C49	5000		23K2025	BPD-005	DD-502	K080	801-005	DC-525	5HK-D5	
C50	5000		23K2025	BPD-005	DD-502	K080	801-005	DC-525	5HK-D5	
C51	1000		23K2025-3	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C52	1000		23K2025-3	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C53	470	500	23K3520-40	M65-0005		SWST47		MC3245	M5-35	
C54	1000		23K2027-9	SI1000	D6-102	TP52	GP2K-102	UC-531	5GA-D1	
C55	5000		23K2025	BPD-005	DD-502	K080	801-005	DC-525	5HK-D5	
C56	.0025	400	23K3407	P488-0033	D8-332	PJ5D33	GP2-333-332	PT5333	5TM-D33	
C57	.01	400	23K3410	P488-01	DD-103	CUB4S1	GP2-333-103	PT4S1	4TM-S1	

CAPACITORS (cont)

ITEM No.	RATING CAP.	RATING VOLT	AIRLINE Part No.	AEROVOX Part No.	CENTRALAB Part No.	CORNELL-DUBILIER Part No.	ERIE Part No.	MALLORY Part No.	SPRAGUE Part No.	NOTES
C58	.0043	600	23K3608	P688-0047	D6-472	CUB6D47	GP2-333-472	PT6347	6TM-D47	
C59	150		23K2027-10	SI150	D6-151	TP36	GP2K-151	UC-5335	5GA-T15	
C60	.0043	600	23K3608	P688-0047	D6-472	CUB6D47	GP2-333-472	PT6347	6TM-D47	
C61	30		23K23	SI30	D6-300	TZ17	GPIK-300		5GA-Q3	
C62	.047	400	23K3414	P488-047	DF-503	CUB4S47		PT4347	4TM-S47	
C63	.0043	400	23K3408	P688-0047	D6-472	CUB4D47	GP2-333-472	PT6347	6TM-D47	
C64	.0043	400	23K3408	P688-0047	D6-473	CUB4D47	GP2-333-472	PT6347	6TM-D47	
C65	.01	400	23K3424	P488-01	D6-103	CUB4S1	GP2-333-103	PT4S1	4TM-S1	
C66	.0033	400	23K3408	P688-0047	D6-473	CUB6D47	GP2-333-473	PT6347	6TM-D47	
C67	5000		23K2025	BPD-005	DD-502	K080	801-005	DC-525	5HK-D5	
C68	.047	400	23K3414	P488-047	DF-503	CUB4S47		PT4147	4TM-S47	
C69	.047	400	23K3414	P488-047	DF-503	CUB4S47		PT4347	4TM-S47	
C70	470	500	23K3500-40	M69-0005		SR5T47		MC8245	M8-35	
C71	470	500	23K3500-40	M69-0005		SR6T47		MC8245	M8-35	
C72	.01	400	23K3410	P488-01	DD-103	CUB4S1	GP2-333-103	PT4S1	4TM-S1	
C73	47		23K2030-15	SI47	D6-470	TP29	GP1K-470	UC-5447	5GA-Q47	
C74	470	500	23K3500-40	M69-0005		SR6T47		MC8245	M8-35	
C75	.0033	400	23K3407	P688-0033	D6-332	PJ6D33	GP2-333-473	PT6333	6TM-D33	
C76	.001	400	23K3404	P688-001	D6-102	CUB6D1	GP2L-102	PT601	6TM-D1	
C77	.01	400	23K3410	P488-01	D6-103	CUB4S1	GP2-333-103	PT4S1	4TM-S1	
C78	390	500	23K3500-39	M69-0004		SR5T39		MC8243	M8-34	
C79	3900		23K2033-4	M64-004		1N5D39		MC8463	M8-24	
C80	680	500	23K3500-85			1W5T68			M8-27	
C81	.01	400	23K3410	P488-01	DD-103	CUB4S1	GP2-333-103	PT4S1	4TM-S1	
C82	5000		23K2025	BPD-005	DD-502	K080	801-005	DC-525	5HK-D5	
C83	.1	400	23K3416	P488-1	DF-104	CUB4P1		PT401	4TM-P1	
C84	5000		23K2025	BPD-005	DD-502	K080	801-005	DC-525	5HK-D5	
C85	5000		23K2025	BPD-005	DD-502	K080	801-005	DC-525	5HK-D5	
C86	.1	600	23K3616	P688-1		PJ6P1		PT601	6TM-P1	
C87	47	5000	23K2025-5	HVD30-47			3KV-470		30GA-Q47	
C88	.01	600	23K3610	6892X-01		PJ6S1		PT611	6TM-S1	
C89	.01	600	23K3610	6892X-01		PJ6S1		PT611	6TM-S1	
C90	.1	300	23K3216	P288-1	DF-104	PJ2P1		PT401	2TM-P1	

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	AIRLINE Part No.	IRC Part No.	CLAROSTAT Part No.	CENTRALAB Part No.	MALLORY Part No.	INSTALLATION NOTES
R1A	1500Ω	½	28E99	* Q7-503				Contrast tapped at 187Ω & 375Ω panel
B	1 Meg	½	Not Req.					Volume & switch - Rear
R2A	5 Meg with 100K stop	½	28E87	Q11-141	AG-85-8	AB-87	SU-57	Brightness - Note 1
B	Shaft		Not Req.	Not Req.	FK8-1/4	AK-1	Not Req.	Attach to R2A
R3A	850KΩ stop	½	28E90	Q11-153	AG-58-8	AB-59	SU-54	Vert. Hold Note 2
B	Shaft		Not Req.	Not Req.	FK8-1/4	AK-1	Not Req.	Attach to R3A
R4A	5 Meg with 1 Meg stop	½	28E88	Q11-141	AG-85-8	AB-87	SU-57	Vert. size- Note 3
B	Shaft		Not Req.	Not Req.	FK8-1/4	AK-1	Not Req.	Attach to R4A
R5A	750Ω	½	28E56	Q11-105	AG-8-8	AB-5	U-4	Vert. Linearity
B	Shaft		Not Req.	Not Req.	FK8-1/4	AK-1	Not Req.	Attach to R5A
R6A	1 Meg	½	28E59	Q11-137	AG-81-8	AB-89	SU-54	Focus
B	Shaft		Not Req.	Not Req.	FK8-1/4	AK-1	Not Req.	Attach to R6A

* CONCENTRIKIT EQUIVALENT KIT K-2 BASE ELEMENTS 6 SHAFTS B17-103ZX & P6-23A (Panel)
B13-137X & B9-314 (Resx) & SWITCH 76-L

Note 1. Connect a 100KΩ resistor in series with the left hand terminal of the control & the lead connecting to the same terminal of the original control. (Control viewed from shaft end, terminals down).
Note 2. Connect a 360KΩ resistor in series with the left hand terminal of the control & the lead connecting to the same terminal of the original control. (Control viewed from shaft end, terminals down).
Note 3. Connect a 1 Meg resistor in series with the right hand terminal of the control & the lead connecting to the same terminal of the original control. (Control viewed from shaft end, terminals down).

RESISTORS

ITEM No.	RATING OHMS	RATING WATT	AIRLINE PART No.	IRC PART No.	NOTES
R7	15KΩ	½	27E153-2	BTS-15K	
R8	47KΩ	½	27E473-2	BTS-47K	
R9	330KΩ	½	27E1009-34	BTS-330K	
R10	220KΩ	½	27E1009-8	BTS-220K	
R11	470Ω	½	27E471-2	BTS-470	
R12	15KΩ	½	27E153-2	BTS-15K	
R13	220KΩ	½	27E224-2	BTS-220K	
R14	10KΩ	½	27E103-2	BTS-10K	
R15	22KΩ	½	27E223-2	BTC-22K	
R16	1000Ω	½	27E102-2	BTS-1000	
R17	1000Ω	½	27E102-2	BTS-1000	
R18	22KΩ	½	27E223-2	BTS-22K	
R19	1000Ω	½	27E102-2	BTS-1000	
R20	47Ω 5%	½	27E470-2	BTS-47 5%	
R21	1000Ω	½	27E102-2	BTS-1000	
R22	18KΩ	½	27E183-2	BTS-18K	
R23	1000Ω	½	27E102-2	BTS-1000	
R24	56Ω	½	27E560-2	BTS-56	
R25	1000Ω	½	27E102-2	BTS-1000	
R26	18KΩ	½	27E183-2	BTS-18K	
R27	120Ω	½	27E121-2	BTS-120	
R28	1000Ω	½	27E102-2	BTS-1000	
R29	1.5Meg	½	27E155-2	BTS-1.5Meg	
R30	5600Ω 5%	½	27E1009-8	BTS-5600 5%	
R31	470KΩ	½	27E474-2	BTS-470K	
R32	270Ω	½	27E271-2	BTS-270	
R33	18KΩ	2	27E183-5	BTS-18K	
R34	5600Ω 5%	½	27E1009-8	BTS-5600 5%	

RESISTORS (cont)

ITEM No.	RATING OHMS	RATING WATT	AIRLINE PART No.	IRC PART No.	NOTES
R35	1800Ω	½	27E182-2	BTS-1800	
R36	4000Ω	5	27E1022		
R37	10KΩ	1	27E103-3	BTA-10K	
R38	680KΩ	½	27E684-2	BTS-680K	
R39	2.2Meg	½	27E225-2	BTS-2.2Meg	
R40	10KΩ	½	27E103-2	BTS-10K	
R41	100KΩ	½	27E1009-10	BTS-100K	
R42	1800Ω	½	27E182-2	BTS-1800	
R43	150Ω	½	27E151-2	BTS-150	
R44	10KΩ	½	27E103-2	BTS-10K	
R45	47Ω	½	27E471-2	BTS-470	
R46	33KΩ	½	27E333-2	BTS-33K	
R47	10KΩ 5%	½	27E1009-35 BTS-10K 5%		
R48	10KΩ 5%	½	27E1009-35 BTS-10K 5%		
R49	56KΩ	½	27E563-2	BTS-56K	
R50	1200Ω	½	27E122-2	BTS-1200	
R51	33KΩ	1	27E333-3	BTA-33K	
R52	470KΩ	½	27E474-2	BTS-470K	
R53	2.2Meg	½	27E225-2	BTS-2.2Meg	
R54	680KΩ	½	27E684-2	BTS-680K	
R55	2200Ω	½	27E222-2	BTS-2200	
R56	22KΩ	½	27E223-2	BTS-22K	
R57	560KΩ	½	27E1009-11	BTS-560K	
R58	680Ω	½	27E683-2	BTS-680	
R59	3300Ω	½	27E332-2	BTS-3300	
R60	22KΩ	½	27E223-2	BTS-22K	
R61	10KΩ	½	27E103-2	BTS-10K	
R62	8700Ω	5	27E1016-20		

RESISTORS (cont)

ITEM No.	RATING OHMS	RATING WATT	AIRLINE PART No.	IRC PART No.	NOTES
R74	6800Ω	1	27E682-3	BTA-6800	
R75	1200Ω	½	27E122-2	BTS-1200	
R76	5600Ω 5%	1	27E1009-8	BTS-5600 5%	
R77	150KΩ	½	27E1009-46	BTS-150K	
R78	82KΩ	½	27E823-2	BTS-82K	
R79	8200Ω	1	27E1009-22	BTS-8200	
R80	470KΩ	½	27E474-2	BTS-470K	
R81	15KΩ	10	27E1016-13	1 3/4A-15K	
R82	2.2Ω	1	23E1015-2		
R83	2200Ω	½	27E222-2	BTS-2200	
R84	220KΩ	½	27E224-2	BTS-220K	

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	AIRLINE Part No.	Stancor Part No.	Merit Part No.	Triad Part No.	RCA TYPE No.	Halldorson Part No.	Thordorson Part No.
T1	117VAC @ 1.45A	550VCT .200ADC	5VAC @ 3A	22E74						
	SEC. 3	SEC. 4	SEC. 5							
	6.3VAC @ 1.2A	6.3VAC @ 6.2A								

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No	USE	AIRLINE Part No.	Stancor Part No.	Merit Part No.	Triad Part No.	RCA TYPE No.	Halldorson Part No.	Thordorson Part No.
T2	Vert. Osc. Trans.	22E70	A-8125 ①	A-3003 ①	A-97X ①		B6702 ①	TV-24A87 ① ④
T3	Horiz. Output Trans.	22E75-L 22E75 ③						
T4	Vert. Output Trans.	22E73	A-8140 ⑤	A-3081 ②③	A-110X		E1805-1 ⑥	T-26S55 ②⑥
T5	Yoke-Horiz. (25MM)	20E782-2	DT-10A ⑦	MDF-74 ⑦ ⑧	Y-20 ⑦ ⑧	214D1 ⑦ ⑧	DF903 ⑦ ⑧	
	Yoke-Vert. (3.4MH)	52E6 ⑩						

① Connect blue lead to cathode, red lead to ground, yellow lead to grid, and green lead to integrator network.
② Drill one new mounting hole.
③ Alternate horiz. out trans.
④ Drill new mounting holes.
⑤ Disconnect as auto transformer.
⑥ Use 50-1 turns ratio.
⑦ Connect jumper from Pin #1 to #8 or #5.
⑧ Use original yoke cover and positioning device.
⑨ Use original yoke network.
10 Yoke cover and positioning device.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	AIRLINE Part No.	Stancor Part No.	Merit Part No	Triad Part No	Halldorson Part No	Thordorson Part No	NOTES
T6	2.4KΩ	3.5Ω	22E71	A-3876	A-2928	S-2X	Z1005		

SPEAKER

ITEM No.	RATINGS SIZE	RATINGS FIELD	RATINGS V C IMP.	AIRLINE Part No.	JENSEN Part No.	QUAM Part No.	NOTES
SP1A	6"	PM	3.5Ω	1E49-2	ST-108 Mod P6-X ST-115 Mod P6-V	6A21	① Used in models 35GSE-3095A, and 35GSE-3097A
B	8"	PM	3.5Ω	①		8A21	

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	AIRLINE Part No.	MEISSNER Part No.	MERIT Part No.	MILLER Part No.	NOTES
L1	IF Trap	0Ω		31B-649				Wound on 68MMF Cap.
L2	IF Trap	0Ω		31B-601				Wound on 68MMF Cap.
L3A	Ant. Coil	0Ω	CT 0Ω	31M-013-3R				Channel 2
B	Ant. Coil	0Ω	CT 0Ω	31M-013-3R				Channel 3
C	Ant. Coil	0Ω	CT 0Ω	31M-013-4R				Channel 4
D	Ant. Coil	0Ω	CT 0Ω	31M-013-5R				Channel 5
E	Ant. Coil	0Ω	CT 0Ω	31M-013-6R				Channel 6
F	Ant. Coil	0Ω	CT 0Ω	31M-013-7R				Channel 7
G	Ant. Coil	0Ω	CT 0Ω	31M-013-8R				Channel 8
H	Ant. Coil	0Ω	CT 0Ω	31M-013-9R				Channel 9
I	Ant. Coil	0Ω	CT 0Ω	31M-013-10R				Channel 10
J	Ant. Coil	0Ω	CT 0Ω	31M-013-11R				Channel 11
K	Ant. Coil	0Ω	CT 0Ω	31M-013-12R				Channel 12
L	Ant. Coil	0Ω	CT 0Ω	31M-013-13R				Channel 13
L4	Fil. Choke	0Ω		34A-546				
L5	Neutr. Coil	0Ω		31B-629				
L6A	RF, Mixer Grid & Osc. Coils	0Ω		31M-113-2R				Channel 2
B	RF, Mixer Grid & Osc. Coils	0Ω		31M-113-3R				Channel 3

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA AIRLINE PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
C	RF, Mixer Grid & Osc. Coils	0Ω		31M-112-4R				Channel 4
D	RF, Mixer Grid & Osc. Coils	0Ω		31M-112-5R				Channel 5
E	RF, Mixer Grid & Osc. Coils	0Ω		31M-112-6R				Channel 6
F	RF, Mixer Grid & Osc. Coils	0Ω		31M-112-7R				Channel 7
G	RF, Mixer Grid & Osc. Coils	0Ω		31M-112-8R				Channel 8
H	RF, Mixer Grid & Osc. Coils	0Ω		31M-112-9R				Channel 9
I	RF, Mixer Grid & Osc. Coils	0Ω		31M-112-10R				Channel 10
J	RF, Mixer Grid & Osc. Coils	0Ω		31M-112-11R				Channel 11
K	RF, Mixer Grid & Osc. Coils	0Ω		31M-112-12R				Channel 12
L	RF, Mixer Grid & Osc. Coils	0Ω		31M-112-13R				Channel 13
L7	Fil. Choke	0Ω		34A-575				
L8	RF Choke	0Ω		31B-638-1				
L9	Feedback Coil	1.4Ω		31B-230				
L10	Conv. Plate	0Ω		31B-682				
L11	RF Choke	1.2Ω		34A-680				
L12	IF Trap	.9Ω		31B-289				
L13	1st. Video IF	.1Ω		20E857	17-4523 *		6219 *	
L14	2nd. Video IF	.1Ω	.1Ω	20E858				Includes trap
L15	3rd. Video IF	.1Ω	.1Ω	20E859				Includes trap
L16	4th. Video IF	.1Ω	.1Ω	20E860				Includes 1N60 Crystal detector (part #95E1), 5MMF Cap. & Series Peaking Coil
L17	Series Peaking Coil	2.6Ω		20E883	19-1005		4612	12 Microhenries
L18	Shunt Peaking Coil	16Ω		20E363-19	19-1923		4648	390 Microhenries
L19	RF Choke	1.2Ω		2E92	19-3001	TV-189	4604	1.5 Microhenries (IRC part #CLA)
L20	Series Peaking Coil	13Ω		20E363-25	19-3250	TV-185	6181	270 Microhenries
L21	4.5MC Trap	3.3Ω		20E785	20-1004	TV-151	1470	
L22	Shunt Peaking Coil	23Ω		20E363-26	19-3860			
L23	Sound IF	3.3Ω		20E785	20-1005	TV-151	1469	
L24	Ratio Det.	4Ω	.7ΩCT	20E783	17-1033	TV-110	1468	Tertiary winding -5.5Ω
L25	Horiz. Osc.	110Ω		20E831	19-1576	TV-163	6210	

* Drill mounting hole.

FILTER CHOKE

ITEM No.	RATINGS TOTAL DIRECT CURRENT	RATINGS D. C. RESISTANCE	RATINGS INDUCTANCE (0 CURRENT 1000 ∿)	REPLACEMENT DATA AIRLINE PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.
L26	.200A	66.4Ω	1.8HY	22E73	C-2325 ①	C-2996 ①	C-21X ①	C5030 ①	

① Drill one new mounting hole.

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA AIRLINE PART No. FUSE	AIRLINE PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M1	3AG S/B	3A 125V	40E8-10	55E57	313003. (3AG S/B-3A)	342001	MDL3	HKP

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA AIRLINE PART No.	SYLVANIA PART No.		NOTES
M2	1N60	95E1	1N60		Video detector (pigtail)

MISCELLANEOUS

ITEM No.	PART NAME	AIRLINE PART No.	NOTES
M3	Tuner	20E856	
M4	Switch	29E30	Locality (AGC)
M5	Centering magnet	62E6	Includes yoke cover
M6	Ion trap	15E174-4 or 6	

TROUBLE SHOOTING AIDS (cont)

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POWER

DEAD SET

If filaments fail to light check fuse M1, AC interlock assembly, switch on volume control and T1. If filaments light, substitute V17. Check B+ filter and decoupling network components.

SMALL AND/OR DIM PICTURE

Substitute V17. Check B+ filter and decoupling network components.

HIGH VOLTAGE

LOSS OF HIGH VOLTAGE

Check by substitution V13, V14, V15 and V16. Check waveform W13.

If Satisfactory	If Unsatisfactory
Check T3, T5A, R82, R81, C83, C86 and other associated components.	Check C82, C78, R80, R78 and other associated components.

INSUFFICIENT HIGH VOLTAGE

Check by substitution V13, V14, V15, V16 and V17. Check picture tube. Proceed as outlined under Loss of High Voltage.

BLOOMING

Check by substitution V16, V15, V14 and V17. Check R82, R81, C83, C86, T3, T5A, picture tube and other associated components. for failure or change of value.

GENERAL

RASTER SOUND NO PIX

Follow procedure outlined under "Loss of Video".

RASTER PICTURE NO SOUND

Follow procedure outlined under "Weak or No Sound".

RASTER NO SOUND NO PICTURE

Check by substitution V1, V2, V3, V4, V5, and V6. Check video detector crystal and assembly. Check components associated with the video IF strip.

NO RASTER NO SOUND

Follow procedure outlined under "Dead Set".

KEYSTONE EFFECT

Check T5, C87 and R65.

INTERMITTENT STREAKS

Check high voltage section for corona discharge and arcing.

Symptoms shown are assumed and are not indicative of the quality and workmanship of this equipment.

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustments of the RF tuner oscillator circuit may be accomplished by removal of the channel selector and fine tuning knobs. The adjustments are accessible, one at a time, thru the small hole in the cabinet to the right of the channel selector shaft.

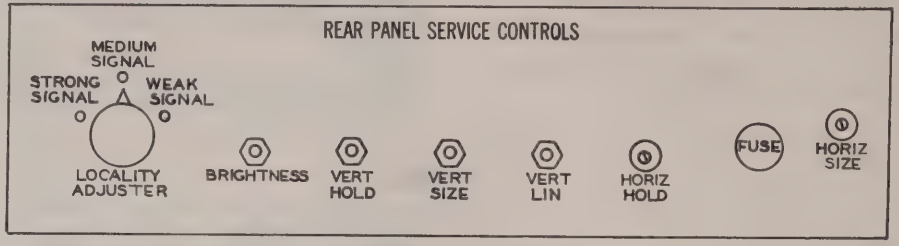
PICTURE TUBE SAFETY GLASS CLEANING

For picture tube safety glass cleaning, it is necessary to remove chassis. (See disassembly instructions).

PICTURE TUBE REMOVAL

For picture tube removal it is necessary to remove chassis. (See disassembly instructions).

SERVICE ADJUSTMENT LOCATION



HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

Adjustment of the horizontal oscillator circuit can be made from the rear panel of the chassis. Adjust the horizontal hold slug (L25) until the picture synchronizes horizontally. If synchronization cannot be obtained by the above adjustment see Trouble Shooting Aids on pages 12 and 17.

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate sound IF detector buzz, adjust the ratio detector secondary (L24) located on top of chassis. (See tube placement chart).

FUSES

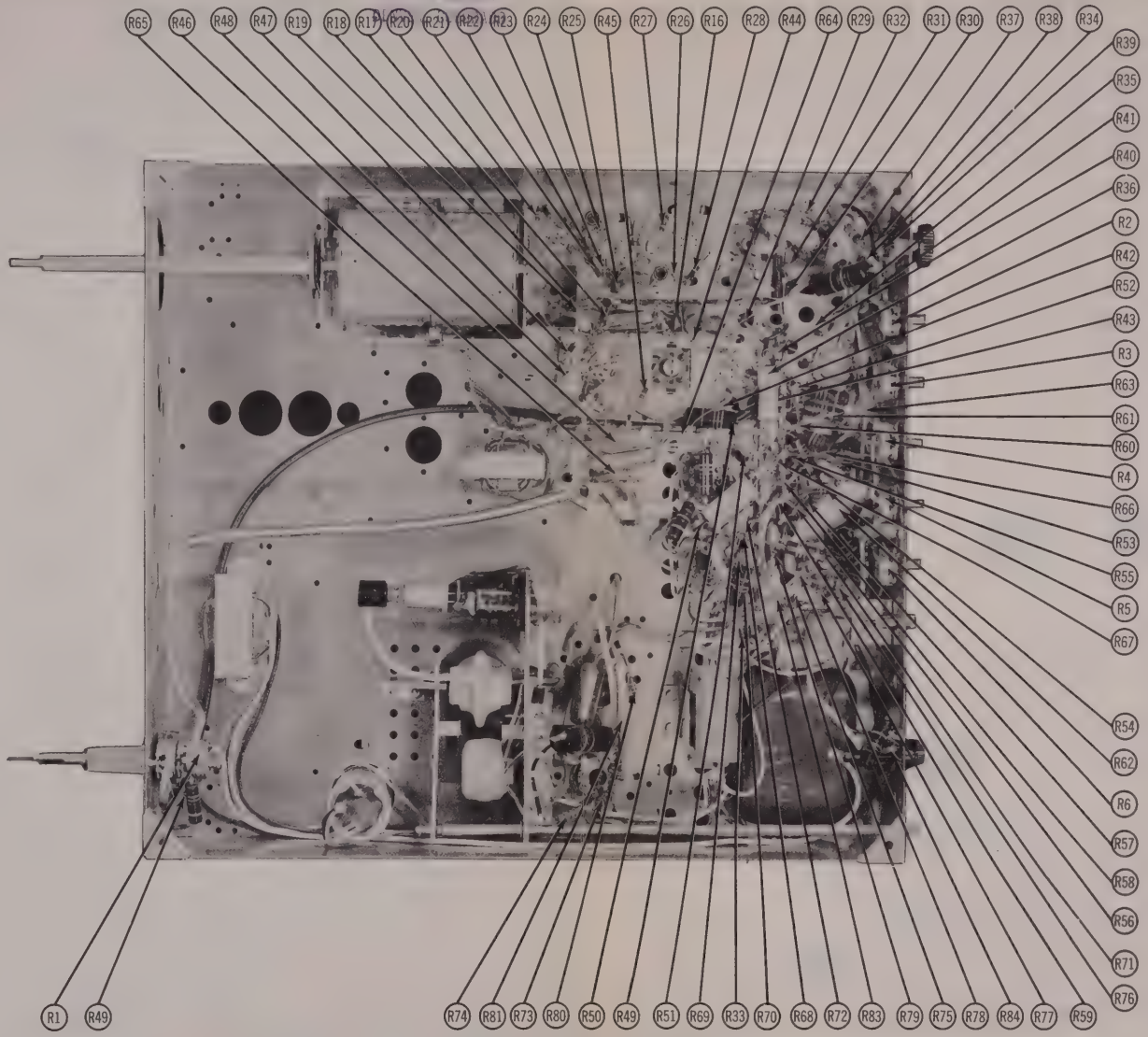
One fuse is used for LV power supply protection. (See tube placement chart for location).

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube, located flush against the deflection yoke. Rotate the two rings around the neck of the tube until the picture is properly centered.

DISASSEMBLY INSTRUCTIONS

1. Remove 4 push on type control knobs from front panel.
2. Disconnect transmission line, built-in antenna.
3. Remove 10 wood and 1 metal screws. Remove rear cover.
4. Disconnect speaker leads.
5. Remove 4 chassis bolts. Remove chassis.
6. Remove 4 speaker nuts. Remove speaker.



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

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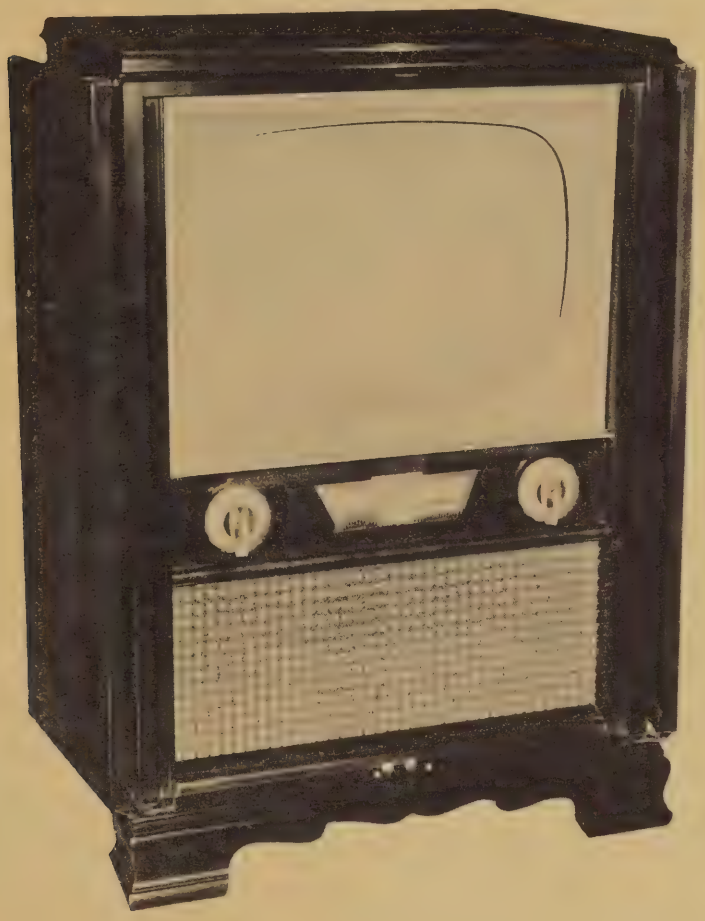

MODEL 9219CM-UHF

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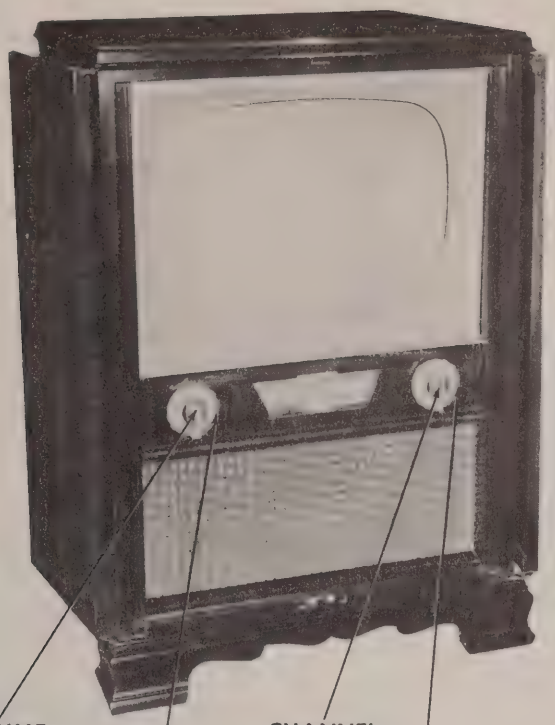

ARVIN MODEL 9219CM-UHF

TRADE NAME	Arvin	MODELS	CHASSIS
		9210CB, CM, 9212CFP, MEA, 9216CB, 9218CB, CM, 9219CM	TE358, -1, -2, -3
		2910CB-UHF, CM-UHF, 9212CFP-UHF, MEA-UHF, 9216CB-UHF, 9218CB-UHF, CM-UHF, 9219CM-UHF	TE363, -1, -2, -3
MANUFACTURER	Arvin Industries, Columbus, Indiana		
TYPE SET	Television Receiver		
TUBES	Twenty-four		
POWER SUPPLY	110-120 Volts AC-60 Cycles	RATING 2.47 Amp. @ 117 Volts AC	
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)		

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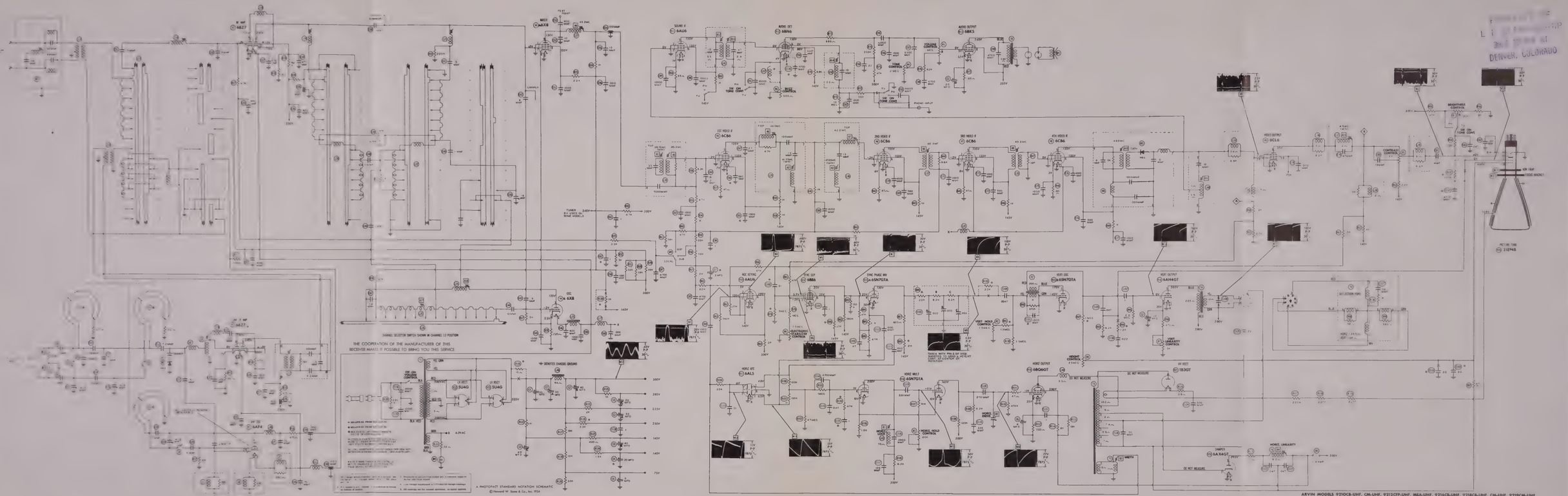
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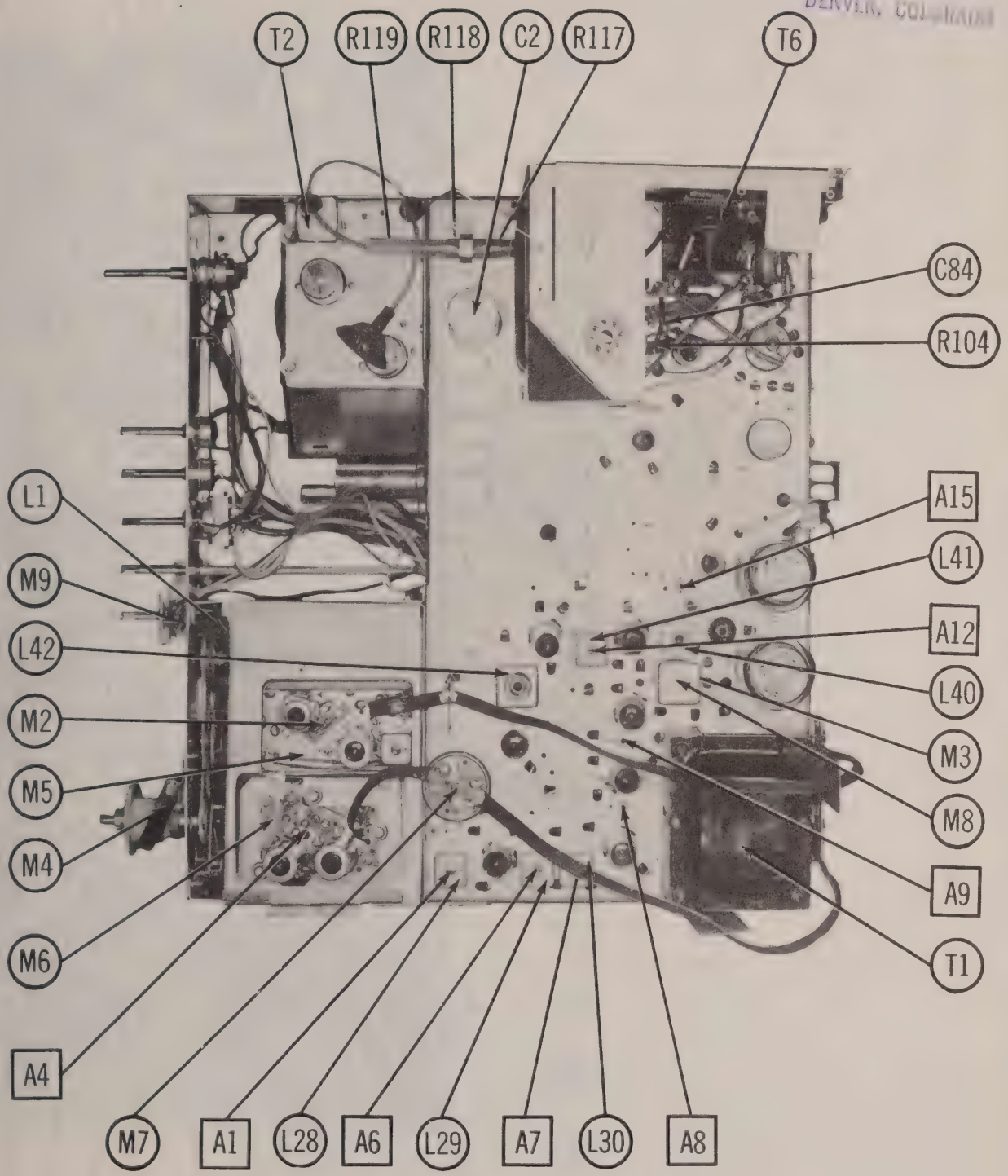

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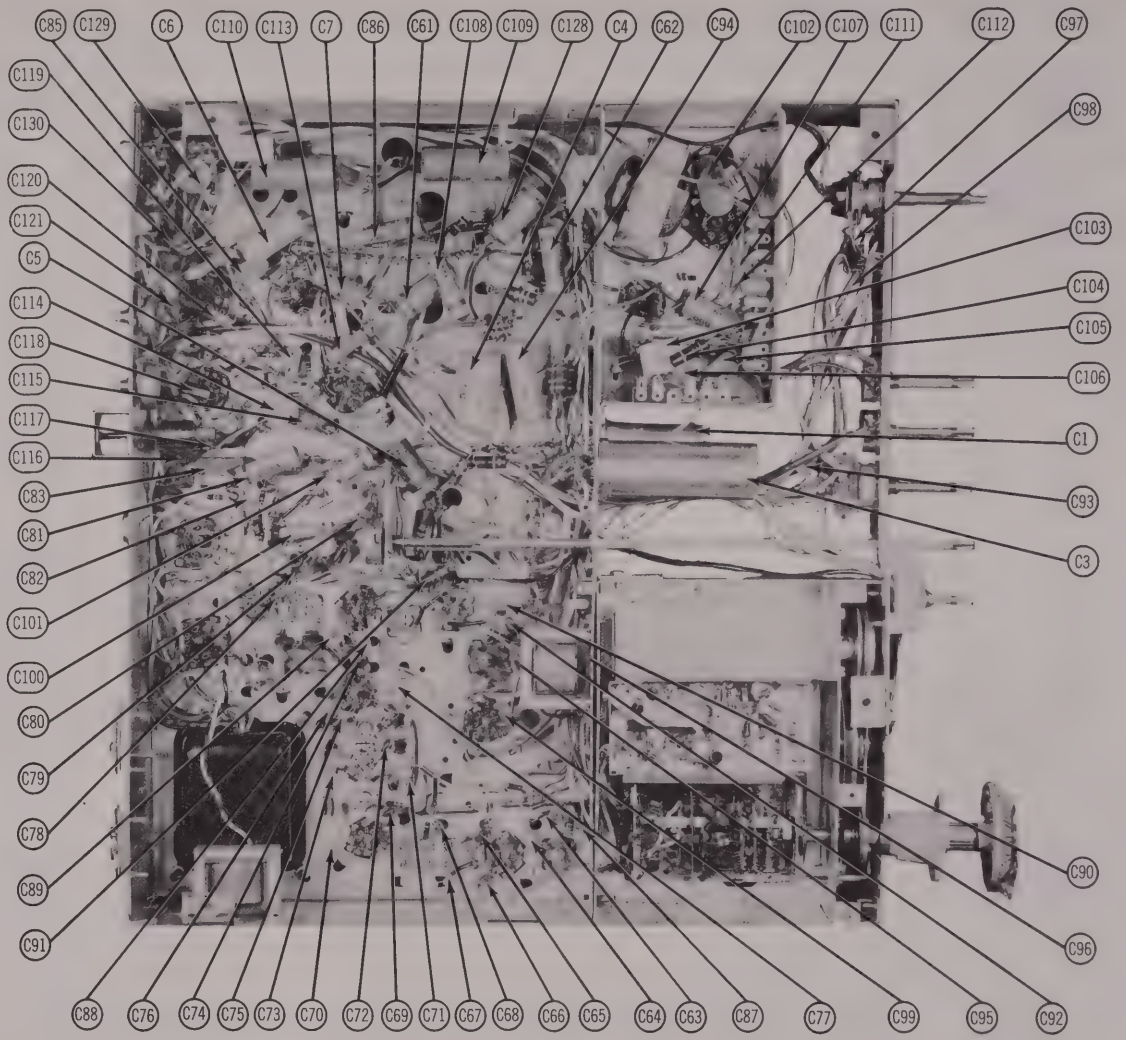

CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION

TUBE PLACEMENT CHART

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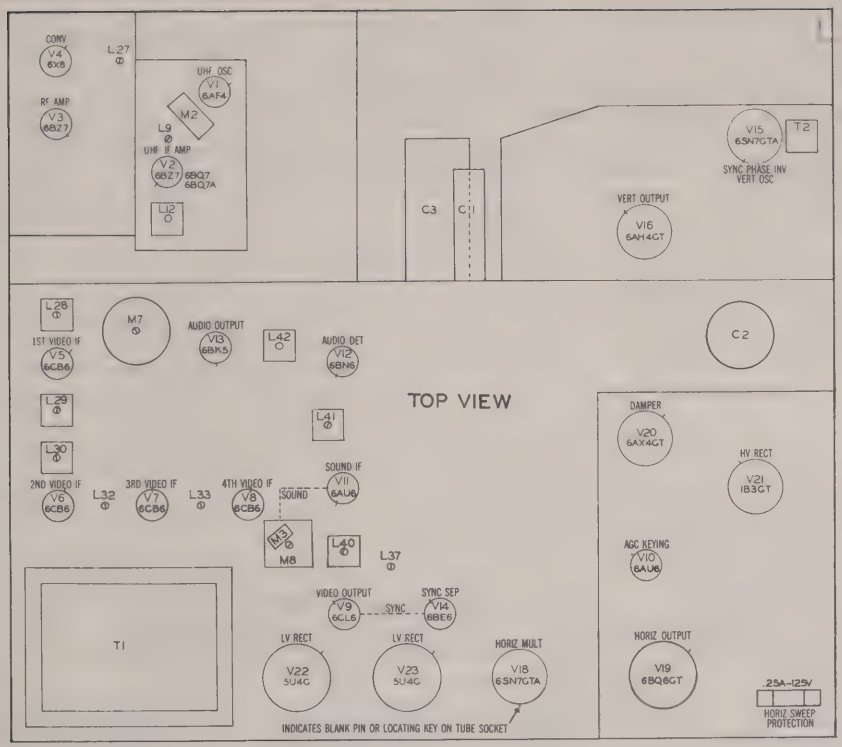


TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - V22, V23

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - V4, V5, V6, V7, V8, (V1, V2 UHF only)
No pic, no sound, has snow - V3, V4, V5
No pic, has sound, has raster - V9, V24
Has pic, no sound - V11, V12, V13
Overloaded picture -V10

SYNC FAILURE
No vert. sync - V15
No horiz. sync - V15, V17, V18
No vert. or horiz. sync - V14, V15

SWEEP FAILURE
No raster, has sound - V18, V19, V20, V21, V24, Fuse (M1)
No vertical deflection - V15, V16
Poor vert. linearity or foldover - V15, V16
Poor horiz. linearity or foldover - V18, V19, V20
Narrow picture - V18, V19, V20, V21, V22, V23
Vert. off freq. - V15
Horiz. off freq. -V15, V17, V18

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage shock hazard may be eliminated by removing the horizontal oscillator tube (V18) from its socket.

VIDEO IF ALIGNMENT

Remove AGC keyer tube (V10) from its socket.
Set local-distance-subruban switch to "suburban".
Connect the negative of a bias supply to the junction of R59 and R60. Connect positive lead to chassis. Adjust bias supply for -2.5 volts at R59 and R60.
Frequencies identified by an asterisk(*) should be used for aligning VHF-UHF chassis only.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to an ungrounded tube shield floating over converter tube (V4). Low side to chassis.	39.75MC (Unmod)	9, 10, or 11	DC probe to point (A). Common to chassis.	A1	Adjust for MINIMUM deflection.
2.	"	"	41.25MC	"	"	A2	"
3.	"	"	47.25MC	"	"	A3	"
4.	"	"	43.25MC * 42.8MC	"	"	A4	Preset A5 all the way out . Adjust A4 for maximum deflection.
5.	"	"	45.2MC * 45.0MC	"	"	A5	Adjust for maximum deflection.
6.	"	"	44.0MC	"	"	A6	"
7.	"	"	42.2MC	"	"	A7	Adjust for maximum deflection. Recheck steps 6 and 7.
8.	"	"	40.3MC	"	"	A8	Adjust for maximum deflection.
9.	"	"	45.2MC	"	"	A9	"
10.	"	"	43.0MC	"	"	A10	Adjust for maximum deflection. Recheck steps 8, 9 and 10.

OVERALL VIDEO IF RESPONSE CHECK

Leave bias connected as under video IF alignment but adjust bias supply for -3.5 volts at junction of R59 and R60.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
11.	Direct	High side to an ungrounded tube shield floating over converter tube. Low side to chassis.	43MC (10MC Swp)	41.25MC 42.25MC 45.0MC 45.75MC	10	Vert. Amp. thru 15KΩ to point (A). Low side to chassis		Adjust A9 and A10 for response similar to Fig. 1. SLIGHT adjustment of A4 and A5 may be necessary to obtain desired response, A9 positions 45.75MC marker and A10 adjusts tilt.

SOUND IF ALIGNMENT

Connect an attenuator in series with receiver antenna.
Tune in a tone modulated TV signal and adjust the attenuator until the signal falls below the limiting level of the 6BN6 limiter detector, as evidenced by a hiss similar to superregeneration. If attenuator is not available, remove antenna lead-in from set and stray feed the signal to the set by placing the lead-in close to the set.
Set buzz control (R6) to its mid-range position.
Adjust the sound take-off coil (A-11), the sound IF (A12, A13) and the quadrature coil A14 for maximum sound of best quality. If during the sound IF alignment the signal rises above the limiting level (hiss disappears), increase the attenuation until the hiss returns.
An alternate method of alingment using a TV signal and VTVM may be used when difficulty is encountered in reducing the signal or the adjustments are very broad.
Connect the antenna lead-in to the antenna terminals and tune in a TV station.
Connect the DC probe of a VTVM thru the detector (Fig. 2) to pin 2 (grid) of V12. Common to chassis.
Adjust A-11, A12 and A13 for maximum deflection.
Remove the VTVM and detector and set buzz control (R6) to its mid-range position.
Adjust A14 for maximum sound. SLIGHTLY readjust R6 for minimum buzz.

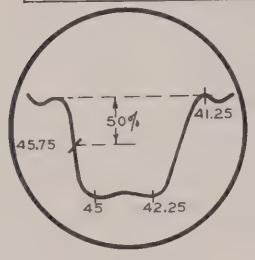


FIG. 1

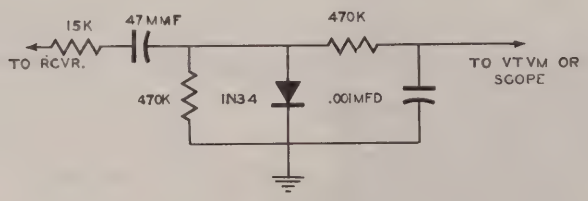


FIG. 2

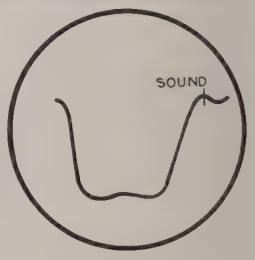
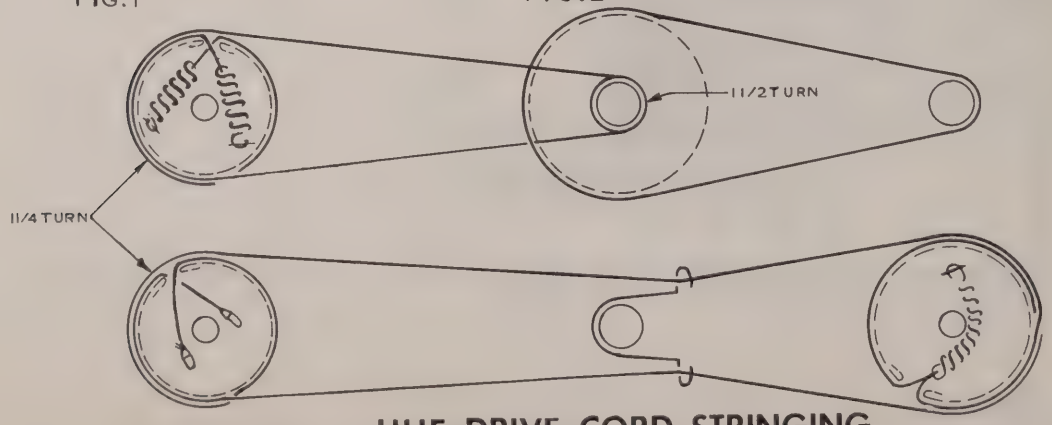


FIG. 3



UHF DRIVE CORD STRINGING

ALIGNMENT INSTRUCTIONS (cont)

4.5MC TRAP ADJUSTMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
12.	.01MFD	High side to pin 9 (grid) of 6CL6 (V9). Low side to chassis.	4.5MC (Unmod)	Any not used locally.	DC probe thru detector (Fig. 2) to point ◇B◇. Common to chassis.	A15	Adjust for MINIMUM deflection.

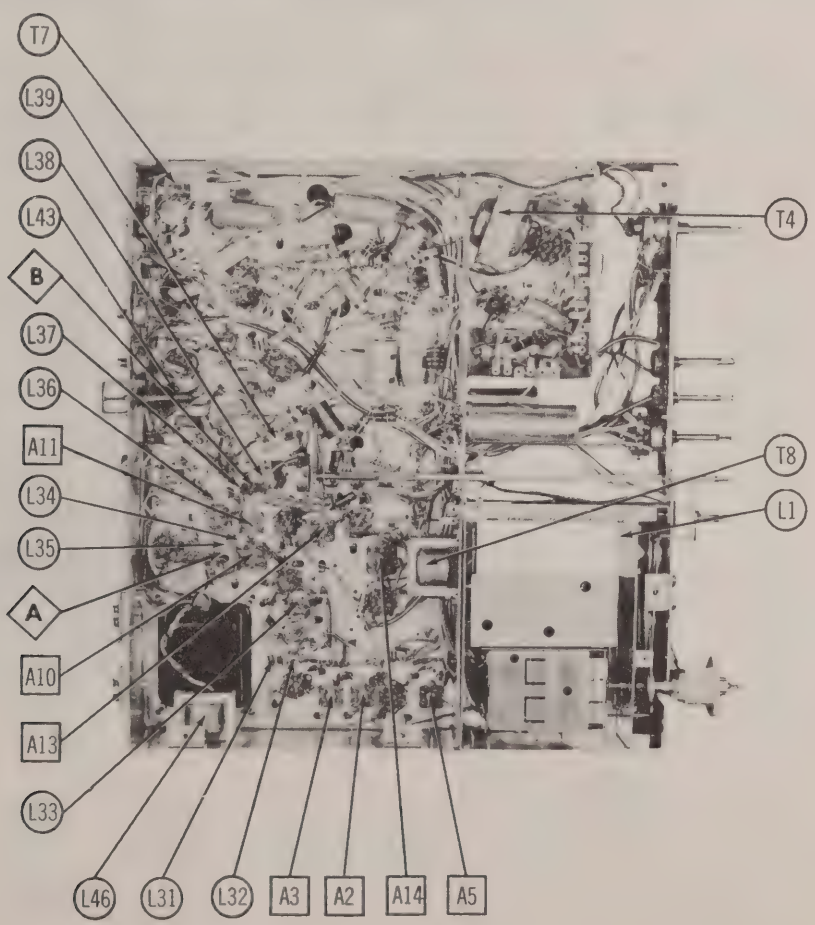
OSCILLATOR ALIGNMENT

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection. The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms. Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
13.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC	215.75MC	13	Vert. Amp. to point ◇A◇. Low side to chassis.	A16	Adjust to place sound marker in trap notch on low frequency side of response curve as in Fig. 3.
14.	"	"	207MC (10MC Swp)	209.75MC	12	"		Check for sound marker placement as in Fig. 3. If necessary, make compromise adjustment of A16 for any individual channel, then check all other high band channels to see that they have not been seriously affected.
			201MC (10MC Swp)	203.75MC	11			
			195MC (10MC Swp)	197.75MC	10			
			189MC (10MC Swp)	191.75MC	9			
			183MC (10MC Swp)	185.75MC	8			
			177MC (10MC Swp)	179.75MC	7			
15.	"	"	85MC (10MC Swp)	87.75MC	6	"	A17	Adjust to place sound marker in trap notch on low frequency side of response curve as in Fig. 3.
16.	"	"	79MC (10MC Swp)	81.75MC	5	"		Check for sound marker placement as in Fig. 3. If necessary, make compromise adjustment of A17 for any individual channel, then check all other low band channels to see that they have not been seriously affected.
			69MC (10MC Swp)	71.75MC	4			
			63MC (10MC Swp)	65.75MC	3			
			57MC (10MC Swp)	59.75MC	2			

RF AND MIXER ALIGNMENT

The RF and mixer portions of the VHF tuner and all of the UHF tuners have been properly aligned at the factory and are very stable. Alignment of these portions should not be required in the field.



CHASSIS BOTTOM VIEW-TRANS., INDUCTOR & ALIGN. IDENTIFICATION

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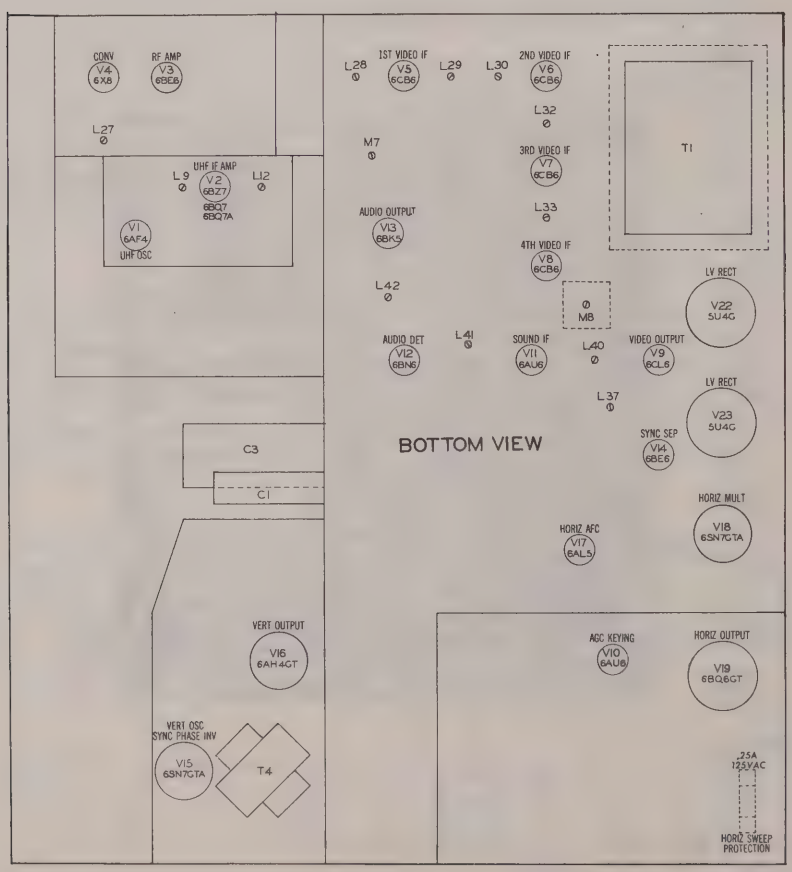
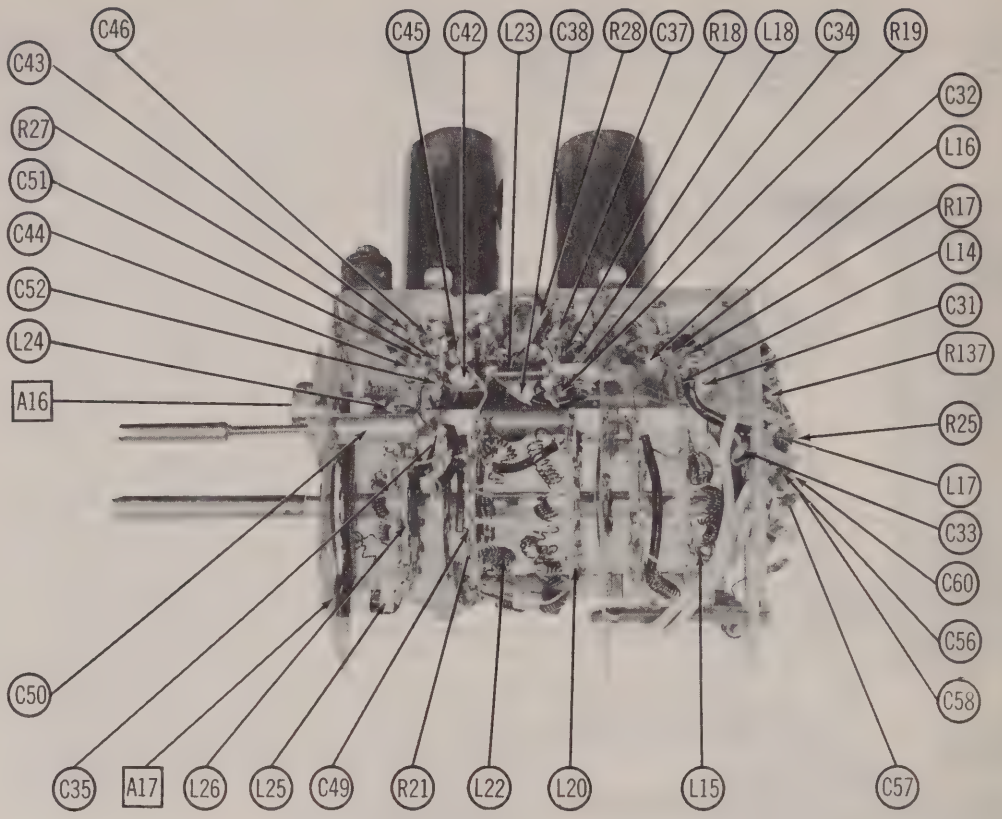
RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6AF4	†10KΩ	10KΩ	.1Ω	0Ω	.1Ω	10KΩ	†10KΩ		
V 2	6BZ7	†3.9KΩ	INF	INF	0Ω	.1Ω	INF	.2Ω	100Ω	0Ω
V 3	6BZ7	†4.4KΩ	460KΩ	INF	.1Ω	0Ω	INF	#180KΩ	0Ω	0Ω
V 4	6X8	0Ω	15KΩ	†7.2KΩ	.1Ω	0Ω	220Ω	220KΩ	†4.7KΩ	†3.5KΩ
V 5	6CB6	92KΩ	47Ω	0Ω	.1Ω	†3.5KΩ	†2.5KΩ	0Ω		
V 6	6CB6	87KΩ	47Ω	0Ω	.1Ω	†2.5KΩ	†2.5KΩ	0Ω		
V 7	6CB6	87KΩ	47Ω	.1Ω	0Ω	†2.5KΩ	†2.5KΩ	0Ω		
V 8	6CB6	.3Ω	180Ω	.1Ω	0Ω	†2.5KΩ	†2.5KΩ	0Ω		
V 9	6CL6	0Ω	3.9KΩ	†20KΩ	0Ω	.1Ω	†7.1KΩ	0Ω	†20KΩ	3.9KΩ
V 10	6AU6	†22KΩ	†2.6KΩ	0Ω	.1Ω	260KΩ	†12.1KΩ	†2.6KΩ		
V 11	6AU6	5.5Ω	0Ω	0Ω	.1Ω	†2.5KΩ	†2.5KΩ	68Ω		
V 12	6BN6	500Ω	3.5Ω	0Ω	.1Ω	†8.3KΩ	39KΩ	†375KΩ		
V 13	6BK5	†2.5KΩ	INF	180KΩ	0Ω	.1Ω	180Ω	180KΩ	†2KΩ	INF
V 14	6BE6	50KΩ	0Ω	.1Ω	0Ω	†48KΩ	†28KΩ	1.5Meg		
V 15	6SN7GT	2.1Meg	▲2.5Meg	0Ω	37KΩ	†3.5KΩ	5.8KΩ	.1Ω	0Ω	
V 16	6AH4GT	2.2Meg	.1Ω	INF	INF	†1.3KΩ	INF	0Ω	1.4KΩ	
V 17	6AL5	4.8Meg	4.8Meg	.1Ω	0Ω	22KΩ	0Ω	22KΩ		
V 18	6SN7GT	100KΩ	†120KΩ	1.2KΩ	5.7Meg	†8.4KΩ	1.2KΩ	0Ω	.1Ω	
V 19	6BQ6GT	INF	0Ω	INF	†9KΩ	470KΩ	INF	.1Ω	200Ω	TOP CAP ▲22Ω
V 20	6AX4GT	INF	INF	100Meg	INF	†120Ω	INF	.1Ω	0Ω	
V 21	1B3GT		PINS	1 - 8	HAVE	INF	RESISTANCE			TOP CAP ▲400Ω
V 22	5U4G	†0Ω	15KΩ	†94Ω	1Ω	INF	11.5Ω	INF	15KΩ	
V 23	5U4G	INF	15KΩ	INF	1Ω	INF	11.5Ω	INF	15KΩ	
V 24	21EP4B	0Ω	8.2KΩ	PIN 10 ▲470KΩ	PIN 11 †180KΩ	PIN 12 .1Ω				

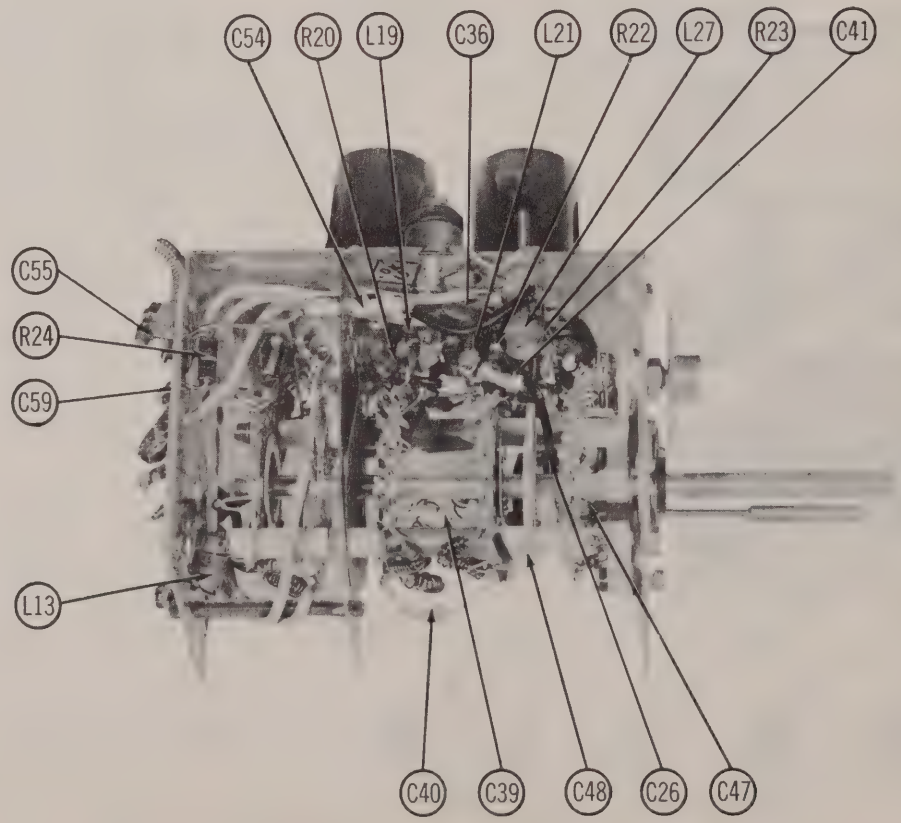
† MEASURED FROM PIN 2 OF V23.
# AGC SWITCH IN LOCAL POSITION.
▲ MEASURED FROM PIN 3 OF V20.



TUBE PLACEMENT CHART



VHF TUNER-RIGHT SIDE



VHF TUNER-LEFT SIDE

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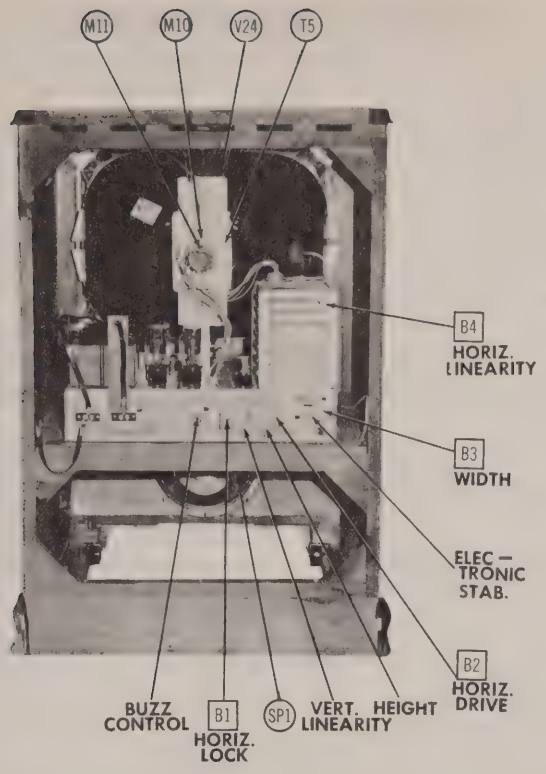


CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn horizontal hold control fully counter clockwise.

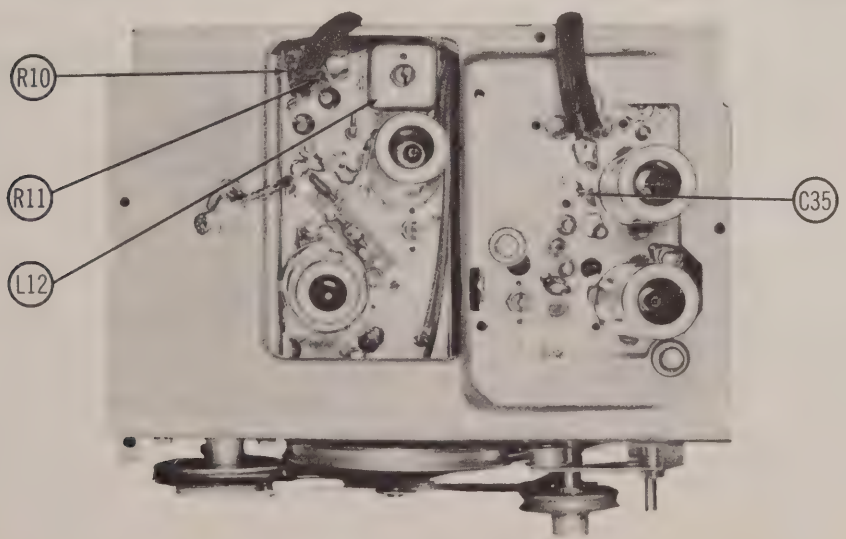
Adjust horizontal lock slug (B1) until 3 or 4 diagonal bars appear.

Turn horizontal hold clockwise until picture syncs. Momentarily switch off channel and back. If picture does not fall in sync slightly retouch B1.

Adjust the horizontal drive trimmer (B2) counter clockwise as far as possible without the presence of a vertical while line or compression near the center of the picture.

Adjust the width slug (B3) for a picture slightly wider than necessary to fill the picture mask horizontally.

Adjust the horizontal linearity (B4) for a picture that is symmetrical from left to right.



UHF TUNER TOP VIEW

SET 238 FOLDER 4

TROUBLE SHOOTING AIDS

SWEEP

HORIZONTAL

LOSS OF SWEEP

Follow procedure outlined under "Loss of High Voltage".

INSUFFICIENT SWEEP

Check by substitution V18, V19, V20, V22 and V23. Check adjustments B2, B3 and B4. Check waveform W16.

If Satisfactory	If Unsatisfactory
Check C121, C122, C123, C125, R113, R114, T3, T5A and other associated circuit components.	Check C117, C118, C119, C120, R105, R106, R108, R109 and other associated components.

DRIVE LINES

Check by substitution V18, V19 and V20. Check adjustment B2. Check C119, C120, C122, C123, C125, T3, T5A and other associated circuit components.

COMPRESSED LEFT SIDE

Check by substitution V18, V19 and V20. Check adjustments B2, B3 and B4. Check horizontal output and damper circuit components especially T3 and T5A.

FOLDS

Follow procedure outlined under "Drive Lines".

XMAS TREE EFFECT

Substitute V18. Check R107, R105, L43, C116, C117 and other associated circuit components.

VERTICAL

LOSS OF SWEEP

Check by substitution V15 and V16. Check waveform W10.

If Satisfactory	If Unsatisfactory
Check T4, T5B, R125, and other associated circuit components.	Check C105, C107, R92, R95, T2 and other associated components.

INSUFFICIENT SWEEP

Check adjustment of height and vertical linearity controls. Proceed as outlined under "Loss of Sweep".

COMPRESSED AT BOTTOM

Check by substitution V15 and V16. Check C2D, T4, T5B and other associated circuit components.

COMPRESSED AT TOP

Check by substitution V15 and V16. Check C105, C107, T2 and other associated circuit components.

FOLDS

Check by substitution V15 and V16. Check components associated with V15B and V16.

SYNC

LOSS OF HORIZONTAL AND VERTICAL SYNC

Check by substitution V14 and V15. Check components associated with V14 and V15A.

LOSS OF VERTICAL SYNC - HORIZONTAL SYNC SATISFACTORY

Check by substitution V14 and V15. Check waveform W8.

If Satisfactory	If Unsatisfactory
Check components associated with V15B.	Check vertical integrator network and other associated components.

LOSS OF HORIZONTAL SYNC - VERTICAL SYNC SATISFACTORY

Check by substitution V17 and V18. Check waveform W13.

If Satisfactory	If Unsatisfactory
Check comporents associated with V17 and V18 especially those assoicated with V18.	Check components associated with V15A.

HORIZONTAL BENDING

Check by substitution V17, V18 and V19. Check horizonal AFC filter network (R102, R103, C114, C115) for failure or change of value.

VIDEO

LOSS OF VIDEO

Check by substitution V9. Check picture tube and other associated components.

SOUND BARS (4.5MC BEAT)

Check adjustment of the fine tuning. Check adjustment of the 4.5MC trap (A15). Check video IF alignment.

POOR CONTRAST

Substitute V9. Check video detector assembly. Check picture tube and other associated circuit components.

NEGATIVE PIX

Substitute V9 and V10. Check video detector crystal and assembly. Check picture tube and other associated circuit components especially the AGC network.

SMEAR

Substitute V9. Check video detector crystal and assembly. Check C81, L34, L36, L38, L39, R54, R52, R5 and other associated circuit components. Check picture tube.

WIDE BLACK BAR ACROSS PIX

Check V3, V4, V5, V6, V7, V8 and V9 for heater to cathode leakage. In case of UHF, check V1 and V2.

AUDIO

WEAK OR NO SOUND

Check by substitution V11, V12 and V13. Check stages of V12 and V13 using audio signal generator. Apply audio signal across R71.

If Satisfactory	If Unsatisfactory
Check audio IF and audio detector alignment and components.	Check components associated with V13.

BUZZ

Align audio detector and IF stages. Follow procedure outlined in the alignment section.

DISTORTED

Follow procedure outlined under "Weak or No Sound".

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA		RETMA BASE TYPE	NOTES
		ARVIN PART No.	STANDARD REPLACEMENT		
V1	UHF Oscillator	6AF4	6AF4	7DK	
V2A	UHF IF Amp.	6BZ7	6BZ7	9AJ	
B	UHF IF Amp.	6BQ7	6BQ7	9AJ	
C	UHF IF Amp.	6BQ7A	6BQ7A	9AJ	
V3	RF Amplifier	6BZ7	6BZ7	9AJ	
V4	Convertor	6X8	6X8	9AK	
V5	1st Video IF Amp.	6CB6	6CB6	7CM	
V6	2nd Video IF Amp.	6CB6	6CB6	7CM	
V7	3rd Video IF Amp.	6CB6	6CB6	7CM	
V8	4th Video IF Amp.	6CB6	6CB6	7CM	
V9	Video Output	6CL6	6CL6	6CL6	
V10	AGC Keying	6AU6	6AU6	7BK	
V11	Sound IF Amp.	6AU6	6AU6	7BK	
V12	Audio Detector	6BN6	6BN6	7DF	
V13	Audio Output	6BK5	6BK5	9BQ	
V14	Sync Separator	6BE6	6BE6	7CH	
V15	Sync Phase Inv Vert. Oscillator	6SN7GTA	6SN7GTA	8BD	
V16	Vert. Output	6AH4GT	6AH4GT	8EL	
V17	Horiz. AFC	6AL5	6AL5	6BT	
V18	Horiz. Mult	6SN7GTA	6SN7GTA	8BD	
V19	Horiz. Output	6BQ6GT	6BQ6GT	6AM	
V20	Damper	6AX4GT	6AX4GT	4CG	
V21	HV Rectifier	1B3GT	1B3GT	3C	
V22	LV Rectifier	5U4G	5U4G	5T	
V23	LV Rectifier	5U4G	5U4G	5T	

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CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA				RETMA BASE TYPE	NOTES
	ARVIN PART No.	SYLVANIA PART No.	GENERAL ELECTRIC PART No.	WESTINGHOUSE PART No.		
V24	21EP4B	21EP4B 21EP4A 21EP4 ①	21EP4B	21EP4B	12D 12N 12D	①Circuit changes necessary.

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	ARVIN PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1	30	400	22422-22	AFH1-51		A047		FP145	TVL-1720	
C2A	▲30	400	22422-20	AFH4-123				FP447	R1457	
B	■60	350		PRS450/20				TC3501		
C	▲20	350								
D	100	50								
C3A	▲50	400	22422-21	AFH4-103				FP431.4	TVL-4707	
B	■60	350						TC78	TVA-1712	
C	▲40	350								
D	20	25								
C4	20	450	25452	PRS450/20		BR2045		TC75	TVA-1709	Note 1
C5	5	250	40002	PRS250/4		BR425		TC50X	TVA-1501	
C6	4	150	25453	PRS150/4		BR415		TC40	TVA-1402	
C7	2	50	41534	PRS150/4		BR245		TC40	TVA-1402	Note 2
C8	1									
C9	1									
C10	1.5									
C11	.4-3									
C12	.39									
C13	.7									
C14	.24									
C15	.4-3									
C16	2.2									
C17	.5									
C18	13									
C19	.4-3									
C20	6									
C21	70			SI68	D6-680		GP1K-680	UC-5468	5GA-Q68	
C22	1000			BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C23	1000			BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C24	1000			BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C25	1000			BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C26	70			SI68	D6-680		GP1K-680	UC-5468	5GA-Q68	
C27	1000			BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C28	1000			EF-001	MFT-1000				503C-D1	
C29	1000			EF-001	MFT-1000				503C-D1	
C30	1000			EF-001	MFT-1000				503C-D1	
C31	15			SI15	D6-150		GP1K-150	UC-5415	5GA-Q15	
C32	3									
C33	800			BPD-0008	DD-102	TM5T8	801-001	DC-521	5HK-D1	
C34	470			BPD-00047	D6-471		GP2K-471	UC-5347	5GA-T47	
C35	1000			EF-001	MFT-1000				503C-D1	
C36	800			BPD-0008	DD-102	TM5T8	801-001	DC-521	5HK-D1	
C37	800			BPD-0008	DD-102	TM5T8	801-001	DC-521	5HK-D1	
C38	.4									
C39	.3									
C40	1									
C41	15			SI15	D6-150		GP1K-150	UC-5415	5GA-Q15	
C42	.8									
C43	1.5									
C44	10			SI10N750	TCN-10		N750K-100	NT-541	5TCU-Q1	
C45	1000			BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C46	800			BPD-0008	DD-102	TM5T8	801-001	DC-521	5HK-D1	
C47	1.2									
C48	.1									
C49	.1									
C50	1-8									
C51	1000			BPD-001	DD-102	TM5D1	801-001	DC- 521	5HK-D1	
C52	10			SI10NP0	TCZ-10		NP0K-100	ZT-541	5TCC-Q1	
C53	800			BPD-0008	DD-102	TM5T8	801-001	DC-521	5HK-D1	

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PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (cont)

ITEM No.	RATING CAP	RATING VOLT	REPLACEMENT DATA ARVIN PART No.	AEROVOX PART No.	CENTRALAB/ CORNELL DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C54	100								
C55	10								
C56	1000			BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1
C57	1000			BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1
C58	1000			BPD-001	DD-103	TM5D1	801-001	DC-521	5HK-D1
C59	1000			BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1
C60	1000			BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1
C61	.1	400	25462-104	P488-1	DF-104	PTE4P1		PT401	4TM-P1 Note 3
C62	.1	200	25455-104	P288-1	DF-104	PJ2P1		PT401	2TM-P1 Note 7
C63	1000		23078	BPD-001	DD-103	TM5D1	801-001	DC-521	5HK-D1
C64	3.3		40355-1	3I2.2NP0	TCZ-3.2		NP0K-2R2		5TCCB-V22 Note 4
C65	1000		23078	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1 Note 5
C66	560		41052-1	81560	D8-561		GP2K-561		5GA-T56 Note 6
C67	3.7		41077-1						
C68	1000		23078	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1
C69	560		41052-1	81560	D8-561		GP2K-561		5GA-T56
C70	1000		23078	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1
C71	1000		23078	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1
C72	560		41052-1	81560	D8-561		GP2K-561		5GA-T56
C73	1000		23078	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1
C74	560		41052-1	81560	D8-561		GP2K-561		5GA-T56
C75	1000		23078	BPD-001	DD-103	TM5D1	801-001	DC-521	5HK-D1
C76	1000		23078	BPD-001	DD-103	TM5D1	801-001	DC-521	5HK-D1
C77	1000		23078	BPD-001	DD-103	TM5D1	801-001	DC-521	5HK-D1
C78	1000		23078	BPD-001	DD-103	TM5D1	801-001	DC-521	5HK-D1
C79	47			3I47NP0	TCZ-47		NP0K-470	ZT-5547	5TCC-Q47
C80	39	500	20290-390	1469-00004		SR5Q4		MC8223	MS-44
C81	.1	200	25455-104	P288-1	DF-104	PJ2P1		PT401	2TM-P1
C82	1000		23078	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1
C83	.047	200	25455-473	P488-047	DF-503	PTE4347		PT4I47	4TM-S47
C84	1000	1000	40108-102						10GA-D1
C85	4700		40054-472	BPD-0047	DD-502	TM5D5	81I-005	DC-525	5HK-D47
C86	.1	200	25455-104	P288-1	DF-104	PJ2P1		PT401	2TM-P1
C87	4700		40053-472	BPD-0047	DD-502	TM5D5	81I-005	DC-525	5HK-D47
C88	10000		40053-103	BPD-01	DD-103	TM5B1	801-01	DC-5I1	5HK-S1
C89	10000		40053-103	BPD-01	DD-103	TM5B1	801-01	DC-5I1	5HK-S1
C90	10000		40053-103	BPD-01	DD-103	TM5B1	801-01	DC-5I1	5HK-S1
C91	10000		40053-103	BPD-01	DD-103	TM5B1	801-01	DC-5I1	5HK-S1
C92	1000		40054-102	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1
C93	10000		40053-103	BPD-01	DD-103	TM5B1	8I1-01	DC-5I1	5HK-S1
C94	.33	400	25462-334	P488-33		PTE4P33		PT4025	4TM-P33
C95	10000		40053-103	BPD-01	DD-103	TM5B1	8I1-01	DC-5I1	5HK-S1
C96	1000		40054-102	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1
C97	3300		40054-332	81330	D8-332		GP2K-333-332	DC-5233	5HK-D33
C98	4700		40054-472	BPD-0047	DD-502	TM5D5	81I-005	DC-525	5HK-D47
C99	4700	1000	40108-472	HVD15-0047					10HK-D47
C100	.68	200	25455-103	P488-01	D8-103	PTE4B1	GP2-333-103	PT4Ii	4TM-S1 Note 8
C101	.1	200	25455-104	P288-1	DF-104	PJ2P1		PT401	2TM-P1
C102	.47	200	25455-474	P288-47		PJ2P5		PT405	2TM-P47
C103A	.002					PTE5D2		PT622	
B	.005		#24168	#PA-110	#PC-100	PTE5D5	#1405-0	PT625	#1910I
C	.005					PTE5D5		PT625	
C104	.047	600	20324-472	1464-005		DR5D5		MC8465	MS-25
C105	.047	600	25461-473	P688-047	DF-503	PTE8347		PT6I47	6TM-S47
C106	.022	200	25455-223	P488-022		PTE4S22		PT4122	4TM-S22 Note 9
C107	.1	600	25461-104	P688-1	DF-104	PTE6P1		PT601	6TM-P1
C108	.1	200	25455-104	P288-1	DF-104	PJ2P1		PT401	2TM-P1 Note 12
C109	.22	600		684-25		PTE6P25		PT6025	6TM-P25 Note 10
C110	.22	600		684-25		PTE6P25		PT6025	6TM-P25 Note 10
C111	1000		40054-102	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1
C112	1000		40054-102	BPD-001	DD-103	TM5D1	801-001	DC-521	5HK-D1
C113	.68	200	25455-103	P488-01	D8-103	PTE4B1	GP2-333-103	PT4Ii	4TM-P1
C114	4700		40054-472	BPD-0047	DD-502	TM5D5	81I-005	DC-525	5HK-D47
C115	.047	200	25455-473	P488-047	DF-503	PTE4347		PT4I47	4TM-S47
C116	3900	500	30433-392	1464-004		DR5D4		MC8463	MS-24
C117	100	500	20290-101	1469-0001		SR5T1		MC8235	MS-31
C118	330	500	20311-331	1469-00035					
C119	330	500	20290-331	1469-00035					
C120	270	500	20290-271	1469-0003		SR5T3			MS-33
C121	.1	400	25462-104	P488-1	DF-104	PTE4P1		PT401	4TM-P1
C122	.047	600	20457-473	P688-047		PTE8347		PT6I47	6TM-S47
C123	.047	600	20457-473	P688-047		PTE8347		PT6I47	6TM-S47
C124	500	20000	24994	HV20C	TV3-502	MMC-20T5	413-501	HV20035A	20DK-T5
C125	.22	400	25462-224	P488-22		PTE4P22		PT4025	4TM-P22
C126	130	5000	40538						
C127	56								
C128	.1	400	25462-104	P488-1	DF-104	PTE4P1		PT401	4TM-P1
C129	10000	1500	41135-103		DD18-103				
C130	10000	1500	41135-103		DD18-103				
C131	1500			BPD-0015	DD-152	TM5D15	801-0015	DC-5215	5HK-D15 Note 11
C132	4700			BPD-0047	DD-502	TM5D5	81I-005	DC-525	5HK-D47 Note 11
C133	.1	400		P488-1	DF-104	PTE4P1		PT401	4TM-P1 Note 11
C134	4700		40053-472	BPD-0047	DD-502	TM5D5	81I-005	DC-525	5HK-D47 Note 13

Note 1. Some Models use 10MFD in this application (Part #41429).
Note 2. Chassis TE-358 and TE-363 use 4MFD in this application.
Note 3. Not used in Ch. TE-358, TE-358-1, TE-363, TE-358-2 and TE-358-3.
Note 4. Chassis TE-358 use 3.3MMF in this application (part #41077-3). Some Ch. TE-363-2, -3 use 1.5MMF.
Note 5. Some Models use 560MMF in this application (part #41052-1).
Note 6. Some Models use 1000MMF in this application (part #23078)
Note 7. Not used in Ch. TE-358, TE-358-1, -2, -3.
Note 8. Ch. TE-358 and TE-363 use .047MFD in this application (part #25461-473).
Note 9. Not used in Ch. TE-358 and TE-363.
Note 10. Ch. TE-358-1, -2, -3 and TE-363-1, -2, -3 may use .47MFD to replace C109 and C110 (part #25461-474).
Chassis TE358, and TE363 use .1MFD in this application (Part # 25461-104).
Note 11. Not used in Ch. TE-358-1 and TE-363-1.
Note 12. Used only in Ch. TE-358-1 and TE-363-1.
Note 13. Used only in Ch. TE-358-3 and TE-363-3.
* Items C103A, C103B, C103C, R89A, R89B, R89C are combined in one unit.

CONTROLS

ITEM No	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA ARVIN PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	100KΩ	½	E22464-50	* QJ-507	RTV-442		UP1SL	Brightness Panel
B	1 Meg	½	Not Req.				UR8-T25 †	Volume tapped at 154K-Rear
C	Switch		Not Req.				US-26	Attach to R1B
R2A	1. 5Meg	½	E22464-29	QII-239	AG-83-8	AB-89	U-155	Vert. Hold
B	Shaft		Not Req.	Not Req.	KS6-3	AK-4	Not Req.	Attach to R2A
R3A	40KΩ	½	E22464-57	QII-123	AG-43-8	AB-81	U-35	Horiz. Hold
B	Shaft		Not Req.	Not Req.	KS6-3	AK-6	Not Req.	Attach to R3A
R4	2 Meg	½	E22464-58					Tone and phono switch
R5	15KΩ	½	E22464-53	QI7-II8KK				Contrast tapped at 6K & 11KΩ
R6	500Ω	1	41038		39-500	AK-1	Not Req.	Buzz
R7A	3000Ω	½	E22464-41	QII-112	AG-15-8	AB-8	U-8	Vert. Linearity
B	Shaft		Not Req.	Not Req.	FK8-1/4	AK-1	Not Req.	Attach to R7A
R8A	2. 5Meg	½	E22464-43	QII-239	AG-84-8	AB-83	SU-566	Height
B	Shaft		Not Req.	Not Req.	FK8-1/4	AK-1	Not Req.	Attach to R8A
R9A	7 Meg	½	E22464-57	QII-123	AG-43-8	AB-89	Electronic	Stabilizer
B	Shaft		Not Req.	Not Req.		AK-1	Not Req.	Attach to R9A

† Universal replacement (Mallory exact duplicate Part No. UE1358).
* CONCENTRIKIT EQUIVALENT KIT- K-2 BASE ELEMENTS & SHAFTS Bil-128 & PI-204 (Panel)
Bl3-137X & Rl-220 (Rear) & SWITCH 76-1.

RESISTORS

ITEM No.	RATING OHMS	RATING WATTS	REPLACEMENT DATA ARVIN PART No.	IRC PART No.	NOTES
R10	100KΩ	1	22381-104	BTS-100K	
R11	100KΩ	1	22381-104	BTS-100K	
R12	10KΩ	1	22381-103	BTS-10K	
R13	100Ω	1		BTS-100	
R14	470KΩ	½	22381-474	BTS-470K	
R15	47Ω	½		BTS-470	
R16	470Ω	½		BTS-470	
R17	4700Ω	1	22381-472	BTS-4700	
R18	1 Meg	1	22382-135	BTS-1 Meg	
R19	750KΩ	1		BTS-750K	
R20	1000Ω	1	22381-102	BTS-1000	
R21	3900Ω	1		BTS-3900	
R22	220KΩ	1	20061-224	BTS-220K	
R23	2200Ω	1	22381-222	BTS-2200	
R24	1000Ω	1	22381-102	BTS-1000	
R25	3900Ω	1		BTS-3900	
R26	4700Ω	1	22381-472	BTS-4700	
R27	15KΩ	1	22381-153	BTS-15K	
R28	220Ω	1		BTS-220	
R29	36KΩ 5%	2	25467-363	BTB-36K 5%	
R30	36KΩ 5%	2	25467-363	BTB-36K 5%	
R31	36KΩ 5%	2	25467-363	BTB-36K 5%	
R32	13KΩ 5%	2	25467-133	BTB-13K 5%	
R33	4700Ω	1	20070-472	BTA-4700	
R34	1000Ω	1	22381-102	BTS-1000	
R35	4700Ω	1	22381-472	BTS-4700	
R36	8200Ω 5%	1	22382-822	BTS-8200 5%	
R37	470 5%	1	22382-470	BTS-47 5%	
R38	1000Ω	1	22381-102	BTS-1000	
R39	1000Ω	1	22381-102	BTS-1000	
R40	1000Ω	1	22381-102	BTS-1000	
R41	1000Ω	1	22381-102	BTS-1000	
R42	470 5%	1	22382-470	BTS-47 5%	
R43	1000Ω	1	22381-102	BTS-1000	
R44	68000Ω 5%	2	22382-683	BTS-6800 5%	
R45	470 5%	1	22382-470	BTS-47 5%	
R46	1000Ω	1	22381-102	BTS-1000	
R47	18KΩ	1	22381-183	BTS-18K	
R48	180Ω	1	22381-181	BTS-180	
R49	10000Ω	1	22381-103	BTS-10000	
R50	12000Ω 5%	1	22382-122	BTS-1200 5%	
R51	27000Ω 5%	1	22382-272	BTS-2700 5%	
R52	60000Ω 5%	4	41075-602		
R53	2200Ω	1	22381-222	BTS-2200	
R54	100KΩ	1	22381-104	BTS-100K	
R55	150KΩ	1	22381-154	BTS-150K	
R56	15KΩ	1	22381-153	BTS-15K	
R57	12KΩ 5%	1	22382-123	BTS-12K 5%	
R58	56KΩ 5%	1	22382-563	BTS-56K 5%	
R59	22KΩ 5%	1	22382-223	BTS-22K 5%	
R60	47K 5%	1	22382-473	BTS-47K 5%	
R61	39KΩ 5%	1	22382-393	BTS-39K 5%	
R62	27KΩ 5%	1	22382-273	BTS-27K 5%	
R63	390KΩ 5%	1	22382-394	BTS-390K 5%	
R64	1.2KΩ 5%	1	22382-123	BTS-12K 5%	
R65	82KΩ 5%	1	22382-823	BTS-82K 5%	
R66	47KΩ	1	22381-473	BTS-47K	
R67	10KΩ	1	22381-103	BTS-10K	
R68	68Ω	1	22381-680	BTS-68	
R69	1000Ω	1	22381-102	BTS-1000	
R70	68000Ω	1	20070-683	BTA-6800	
R71	10 Meg	1	20061-106	BTS-10 Meg	
R72	39KΩ	1	22381-393	BTS-39K	
R73	6800 5%	1	22382-681	BTS-680 5%	
R74	330KΩ	1	22381-334	BTS-330K	
R75	47KΩ	1	20061-473	BTS-47K	
R76	82KΩ	1	22381-823	BTS-82K	

ITEM No.	RATING OHMS	RATING WATTS	REPLACEMENT DATA ARVIN PART No.	IRC PART No.	NOTES
R77	180Ω	1	20070-181	BTA-180	
R78	1. 5 Meg	1	22381-155	BTS-1. 5Meg	Note 1
R79	1 Meg	1	22382-135	BTS-1 Meg	
R80	27KΩ 5%	1	22382-273	BTS-27K 5%	Note 2
R81	47KΩ	1	22381-473	BTS-47K	
R82	150KΩ	1	22381-154	BTS-150K	
R83	390KΩ	1	22381-394	BTS-390K	
R84	47KΩ	1	22381-473	BTS-47K	
R85	1100Ω 5%	1	22382-112	BTS-1100 5%	
R86	4700Ω	1	22381-472	BTS-4700	
R87	8200Ω 5%	1	22382-821	BTS-820 5%	
R88	12000Ω 5%	1	22382-122	BTS-1200 5%	Note 3
R89A	22KΩ	½		BTS-22K	
B	8200Ω	½	+ 24168	BTS-8200	
C	8200Ω	½		BTS-8200	
R90	470KΩ	1	22381-474	BTS 470K	
R91	1. 3Meg	1	22382-135	BTS-1. 3Meg	Note 9
R92	1 Meg	1	22382-135	BTS-1 Meg	Note 6
R93	8200Ω 5%	1	22382-822	BTS-8200 5%	
R94	1200Ω 5%	1	22382-122	BTS-1200 5%	Note 7
R95	2. 2Meg	1	22381-225	BTS-2. 2Meg	
R96	470Ω	1		BTA-470	
R97	470KΩ	1	22381-474	BTS-470K	
R98	560Ω	1		BTS-560	
R99	560Ω	1		BTS-560	
R100	100KΩ 5%	1	22382-104	BTS-100K 5%	
R101	100KΩ 5%	1	22382-104	BTS-100K 5%	
R102	6. 7Meg	1	22381-675	BTS-6. 7Meg	
R103	1 Meg	1	22382-135	BTS-1 Meg	
R104	22KΩ	1	20302-223	BTB-22K	
R105	8200Ω	1	20070-822	BTA-8200	
R106	1200Ω	1	22381-122	BTS-1200	
R107	91KΩ 5%	1	22382-913	BTS-91K 5%	
R108	120KΩ	1	22381-124	BTS-120K	
R109	8200Ω	1	22381-822	BTS-8200	
R110	470KΩ	1	22381-474	BTS-470K	
R111	47Ω	1	20061-470	BTS-47	
R112	220Ω	5	23970-16	3 3/4A-225	
R113	18KΩ	2	20302-183	BTB-18K	
R114	18KΩ	2	20302-183	BTB-18K	
R115	10Ω	1	20308-100	BTS-10	
R116	5. 6Ω	23	20209-39		
R117	220KΩ	2		BTB-220K	
R118	220KΩ	2		BTB-220K	
R119	220KΩ	2		BTB-220K	
R120	220KΩ	1	20061-224	BTS-220K	
R121	2000Ω	5	23970-18	3 3/4A-2000	
R122	110Ω	23	40056		
R123	400Ω	5	23970-27	3 3/4A-400	
R124	15000Ω 5%	3	25467-152	BTB-1500 5%	
R125	100Ω	1	20070-102	BTA-1000	
R126	3300Ω	1	20070-332	BTA-3300	Note 5
R127	10KΩ	2	25467-103	BTB-10K	
R128	10KΩ	2	25467-103	BTB-10K	
R129	30KΩ	1	22382-303	BTA-30K	
R130	1000Ω	1	20061-102	BTS-1000	Note 10
R131	22Ω	1	22381-220	BTS-22	
R132	100KΩ	1	22381-104	BTS-100K	Note 4
R133	22KΩ	1	22382-223	BTS-22K	Note 4
R134	47KΩ	1	22381-473	BTS-47K	Note 4
R135	10Ω	10			Note 8
R136	1000Ω	1		BTS-1000	
R137	100KΩ	1		BTS-100K	
R138	3. 3Meg	1		BTS- 3. 3Meg	

Note 1. Chassis No. TE363 and TE358 use a 3. 3 Meg resistor in this application.
Note 2. Chassis No. TE363 and TE358 use a 39KΩ resistor in this application.
Note 3. Chassis No. TE363 and TE358 use a 1800Ω resistor in this application.
Note 4. Used in chassis No. TE358 and TE363 only.
Note 5. Chassis No. TE363 uses a 1500Ω resistor in this application.
Note 6. Chassis No. TE363 and TE358 use a1. 5 Meg resistor in this application.
Note 7. Used in chassis No. TE363-1 & TE358-1 only.
Note 8. Used in chassis No. TE358 only.
Note 9. Chassis No. TE 363-2, 3 and TE358-2, 3 use 1. 5 Meg resistor in this application.
Note 10. Not used in chassis # TE358.
* Items R89A, R89B, R89C, C103A, C103B, C103C are combined in one unit.

TRANSFORMER (POWER)

ITEM No	RATING PRI	RATING SEC 1	RATING SEC 2	REPLACEMENT DATA ARVIN PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	RCA TYPE No.	Hallicrafters PART No.	Thordarson PART No.
T1	117VAC	590VCT	5VAC	S40926	P-8167 ① ②	P-3055			P9737 ③ ④	
	2.47A	.380ADC	6A							
	SEC 3	SEC 4	SEC 5							
	6.3VAC									
	10.8A									

① Drill new mounting holes.
② Parallel and phase 6.3V windings for Sec. #3.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No	USE	ARVIN PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	RCA TYPE No.	Hallicrafters PART No.
T2	Vert. Osc. Trans.	C-22446-1	A-8122 ①	A-4003	A-97V	208T9	
T3	Horiz. Output Trans.	E-41024	A-8137 & WC-5 ②	HVO-9 & MWC-1 ③	D-19 & WC-11 ④	232T1 ⑤	
T4	Vert. Output Trans.	41023-1	A-8113 ①	A-3026	A-98X		
T5A	Yoke-Horiz. (20MH)	D-24807	DY-11A ⑤	MDF-73 ⑤	Y-19 ⑤	222D1	DF605
B	Yoke- Vert. (37MH)						
T6	Horiz. Linearity (1.2-11MH)	C-40533		MWC-6	WC-12 ① ⑦	213R1 ①	
T7	Width (2.15-15MH)	41020		MWC-6	WC-12 ① ⑦	212R1 ①	

① Drill new mounting hole.
② Connect original terminal #9 to new terminal #7, original #6 to new "T", original #7 to new #"T", original "T" to new #1. Connect coded red and blue terminals of WC-5 to terminals #1 and #3. Connect coded black and orange terminals to AFC. If picture is out of phase, reverse black and orange terminals.
③ Connect original terminal #9 to new terminal #9, original #6 to new #7, original #7 to new #5, original #"T", to new #1. Connect coded red and blue terminals of MWC-1 to terminals #1 and #2. Connect coded black and orange terminals to AFC. If picture is out of phase, reverse black and orange terminals.
④ Connect terminal #8 to terminal #7, then connect original terminal #9 to new #9, original #6 to new #6 and #7, original #7 to new #5, original #"T" to new #1. Connect coded black and orange terminals of WC-11 to terminals #1 and #3. Connect coded red and blue terminals to AFC. If picture is out of phase, reverse red and blue terminals.
⑤ Use original horizontal deflection coil network, if necessary.
⑥ Use original deflection coil network and leads.
⑦ Connect to coded red and blue terminals.
⑧ Use Fig. 2 of instruction booklet packed with unit for terminal connections.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI	IMPEDANCE SEC	REPLACEMENT DATA ARVIN PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Hallicrafters PART No.	Thordarson PART No.	NOTES
T8	5.4KΩ	3 8Ω	24776-5	A-3877 ①	A-3019	S-57	Z1002	T-26S49	① Drill one new mounting hole

SPEAKER

ITEM No.	RATINGS SIZE	RATINGS FIELD	RATINGS V C IMP	REPLACEMENT DATA ARVIN PART No	VIKING PART No	QUAM PART No	NOTES
SP1	10"	PM	3. 8Ω	D25519	10J11	10A31	

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI	DC RES. SEC.	REPLACEMENT DATA ARVIN PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No	NOTES
L1A	UHF Ant.Coil	0Ω						
B	UHF Mixer Coil	0Ω						
C	UHF Osc.Coil	0Ω						
L2	UHF Ant.Coil end inductor	0Ω						
L3	UHF Mixer coil end inductor	0Ω						
L4	UHF Osc. coil and inductor	0Ω						
L5	FIL Choke	0Ω						Wound on 330Ω resistor
L6	FIL Choke	0Ω						Wound on 330Ω resistor
L7	Cathode Choke	.1Ω						Wound on 680Ω resistor
L8	UHF IF Coupling	.1Ω						
L9	UHF IF input coil	0ΩCT						
L10	Feedback Coil	.1Ω						
L11	FIL Choke	.1Ω						
L12	UHF IF output coil	0Ω						Includes 15KΩ resistor, 2-8. 2MMF capacitor, & 15MMF capacitor
L13	UHF IF coupling trans	0ΩCT	0Ω					
L14	VHF Ant. transformer	0ΩCT	0ΩCT					
L15	VHF Ant.Coil	0Ω						
L16	VHF Ant.Coil plate coil	0Ω						Channel 13
L17	FIL Choke	.2Ω						56 Microhenry; UNC Part # CL-1
L18	Neutr. Coil	0Ω						
L19	VHF RF Coil	0Ω						Channel 13
L20	VHF RF Coils	0Ω						
L21	VHF Mixer grid coil	0Ω						Channel 13
L22	VHF Mixer grid coils	0Ω						
L23	FIL Choke	0Ω						
L24	VHF Osc. plate coil	0ΩCT						Channel 13
L25	VHF Osc.Coil	0Ω						Channel 6
L26	VHF Osc.Coil	0Ω						
L27	Conv. Plate	0Ω						

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (cont)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA ARVIN PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L28	1st Video IF grid	.1Ω		41175	17-4531 *		6216 *	Includes trap, 22KΩ resistor, & .005MMF capacitor
L29	1st Video IF plate	.1Ω		41171			6217	Includes trap 4700Ω resistor, & 100MMF capacitor
L30	2nd Video IF grid	.1Ω		41172			6218	Includes trap
L31	Fil. Choke	0Ω		23095	19-3001	TV-189	6175	.6 Microhenry
L32	3rd Video IF	.3Ω	.3Ω	41173	20-1045		6219	
L33	4th Video IF	.3Ω	.3Ω	41173	17-4523		6219	
L34	Series Peak. Coil	3.4Ω		25468-18	19-3093 †	TV-181 †	6177 †	93 Microhenries; wound on 6800Ω resistor
L35	Shunt Peak. coil	9.5Ω		25468-15	19-3500	TV-188	6174	500 Microhenries
L36	Series Peak. coil	5Ω		25468-19	19-3180 ▲	TV-184 ▲	6180▲	185 Microhenries; wound on 8200Ω resistor
L37	4.5MC trap	1.2Ω		25609	20-1004	TV-151	1470	
L38	Shunt Peak. Coil	12Ω		25468-16	19-3500 ■	TV-188 ■	6174 ■	500 Microhenries; wound on 10KΩ resistor
L39	Series Peak. coil	6Ω		25468-20	19-4200	TV-185 ▲	6154 ▲	215 Microhenries; wound on 8200Ωresistor
L40	1st Sound IF	6.5Ω (tap @ 5.5Ω		41176	17-1025			Includes 10 MMF capacitor
L41	2nd Sound IF	5.5Ω	3.4Ω	41177	17-1021	TV-108 ‡	1466 ‡	
L42	Quadrature coil	5.5Ω		40937			1470-A **	
L43	Horiz. Osc.	70Ω		23449	19-1576	TV-163	6210	
L44	RF Choke	3.3Ω		25468-10	19-3093	TV-181	6177	93 Microhenries
L45	RF Choke	.1Ω						
L47	RF Choke			25468-1	19-3180	TV-184	6180	185 Microhenries; Note 1

† Parallel with 6.8KΩ resistor.
▲ Parallel with 8.2KΩ resistor.
* Use secondary and trap windings only; add .005 MMF capcitor externally.
■ Parallel with 10KΩ resistor.
▲ Parallel with 8200Ω resistor.
‡ Drill one new mounting hole.
** Use adaptor plate and add 10MMF capacitor externally.
Note 1. Used in chassis TE358-3 & TE363-3 only.

FILTER CHOKE

ITEM No.	RATINGS TOTAL DIRECT CURRENT	RATINGS D.C. RESISTANCE	RATINGS INDUCTANCE (0 CURRENT 1000 ∿)	REPLACEMENT DATA ARVIN PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.
L46	.220ADC	94Ω	1.7HY	40925-1	C-2327	2991 ①	C-21X ①	C5037 ①	T-28C44①

① Drill one new mounting hole.

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA ARVIN PART No. FUSE	ARVIN PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M1	3AG S/B P/T	1/4A 250V	40663		315.250 (3AG S/B P/T-1/4A)		MDV 1/4	

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA ARVIN PART No.	REPLACEMENT DATA SYLVANIA PART No.		NOTES
M2	1N82		1N82 or 1N82A		UHF Mixer
M3	1N64		1N132		Part of M8 video detector assembly

MISCELLANEOUS

ITEM No.	PART NAME	ARVIN PART No.	NOTES
M4	Dial light	19351	# 47 bayonet-station indicator
M5	Tuner		UHF part of dual unit 25267-12
M6	Tuner		VHF part of dual unit 25267-12 (40444-1)
M7	Trap	41464	41 MC trap
M8	Video detector		Assembly (includes 1N64 crystal)
M9	Switch	41039	Local-distance
M10	Focus magnet		PM-includes centering device (40991-2)
M11	Ion trap	25662-3	
B2	Trimmer cap	24528	40-370MMF horiz. drive
	Knob	40935-3	Channel indicator, models 9210, 16, 18, 19CM or CB UHF
	Knob	40935-2	Channel indicator, models 9212CFP UHF
	Knob	40935-4	Channel indicator, models 9212MEA UHF
	Knob	40934-3	Volume, models 9210, 16, 18, 19 CM, CB UHF
	Knob	40934-2	Volume, models 9212 CFP UHF
	Knob	40934-4	Volume, models 9212 MEA UHF
	Knob	40933	Fine tuning
	Knob	40932	Brightness
	Knob	24699-7	Behind control door
	Safety glass	24947	

TROUBLE SHOOTING AIDS (cont)

PROPERTY OF
L. F. BLANKENSHIP
3324 MEADE ST
DENVER, COLORADO

POWER

DEAD SET

If filaments fail to light, check AC interlock assembly, switch on volume control and T1. If filaments light, check by substitution V22 and V23. Check B+ filter and decoupling circuit components.

SMALL AND/OR DIM PIX

Substitute V22 and V23. Check B+ filter and decoupling network components.

HIGH VOLTAGE

LOSS OF HIGH VOLTAGE

Check fuse M1. Check by substitution V18, V19 , V20 and V21. Check waveform W16.

If Satisfactory	If Unsatisfactory
Check R116, R117, R118, R119, R113, R114, C121, C124, T3, and T5A. Check other associated circuit components.	Check C118, C120, R108, R110 and other associated circuit components.

INSUFFICIENT HIGH VOLTAGE

Check by substitution V18, V19, V20, V21, V22 and V23. Check picture tube. Proceed as outlined under "Loss of High Voltage".

BLOOMING

Check by substitution V18, V19, V20 and V21. Check R116, R117, R118, R119, C124, T3, T5A, picture tube and other associated circuit components.

GENERAL

RASTER SOUND NO PIX

Follow procedure outlined under "Loss of Video".

RASTER NO SOUND NO PIX (VHF)

Check by substitution V3, V4, V5, V6, V7 and V8. Check video detector assembly and other associated circuit components.

RASTER NO SOUND NO PIX (UHF)

Check V1 and V2 by substitution.

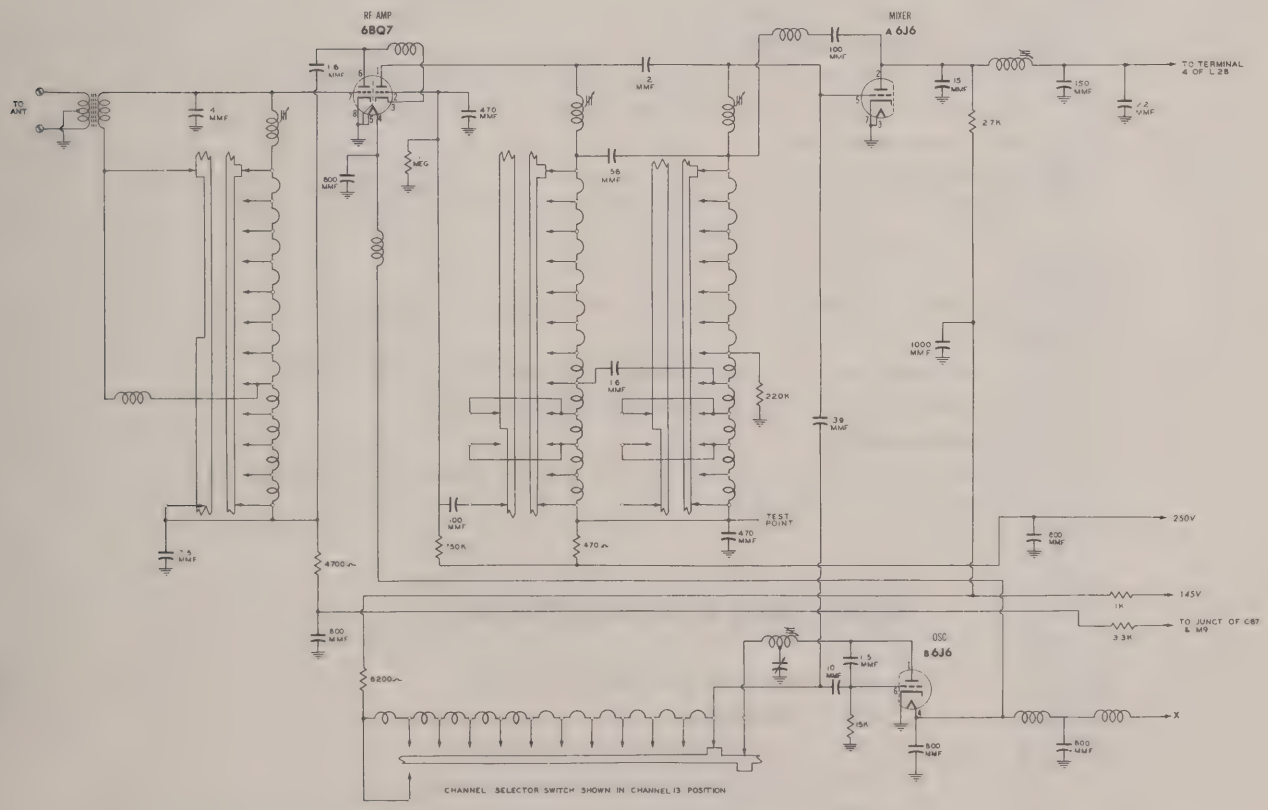
NO RASTER NO SOUND

Follow procedure outlined under "Dead Set".

INTERMITTENT STREAKS

Check high voltage section for corona discharge and arcing. Check video signal for interference pulses.

Symptoms shown are assumed and are not indicative of the quality and workmanship of this equipment.



A PHOTOFACT STANDARD NOTATION SCHEMATIC

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ALTERNATE VHF TUNER (PART NO 41047-1) USED IN SOME MODELS

ALTERNATE TUNER SCHEMATIC

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustments of the RF tuner oscillator circuit may be accomplished by removing the channel selector and fine tuning knobs.

PICTURE TUBE SAFETY GLASS CLEANING

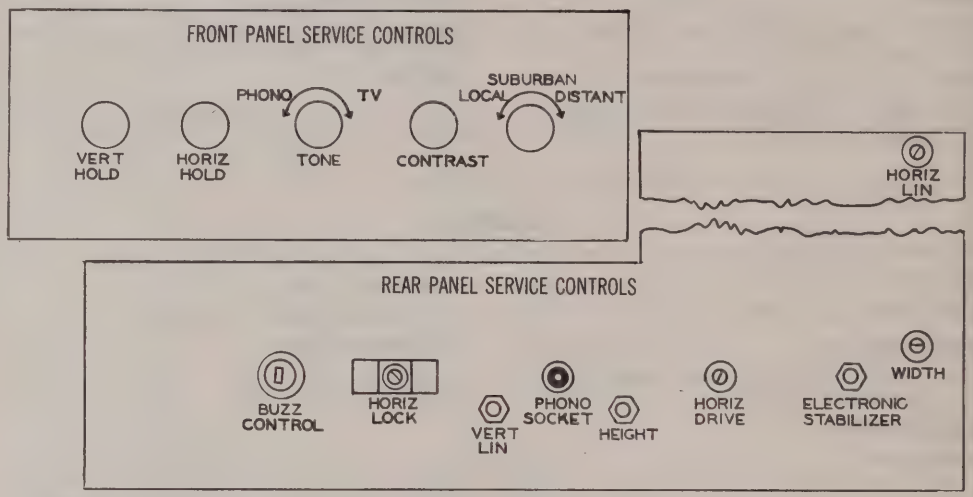
To clean safety glass remove 4 wood screws holding wood strip at top of safety glass.

Remove wood strip and safety glass. Use extreme caution when removing safety glass.

PICTURE TUBE REMOVAL

For picture tube removal it is necessary to remove chassis. (See disassembly instructions) .

SERVICE ADJUSTMENT LOCATION



SPECIAL ADJUSTMENTS - AUTOMATIC ELECTRONIC STABILIZER CONTROL

If results of electrical interference makes picture unstable, tune in a strong TV station and turn control clockwise until picture shifts or distorts, then counter clockwise until shifting or distorting disappears.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

Adjustment of the horizontal oscillator can be made from the rear panel of the chassis. Set the horizontal hold control at the mid-position of its range and adjust the horizontal lock slug (L43) until picture synchronizes horizontally. (For location see tube placement chart).

SOUND IF DETECTOR BUZZ ADJUSTMENT

Adjust the buzz control located on rear apron of chassis for maximum volume and minimum buzz. If results are unsatisfactory see alignment instructions on pages 6 and 7.

FUSES

One fuse is used for horizontal sweep circuit protection. (For location, see tube placement chart).

CENTERING

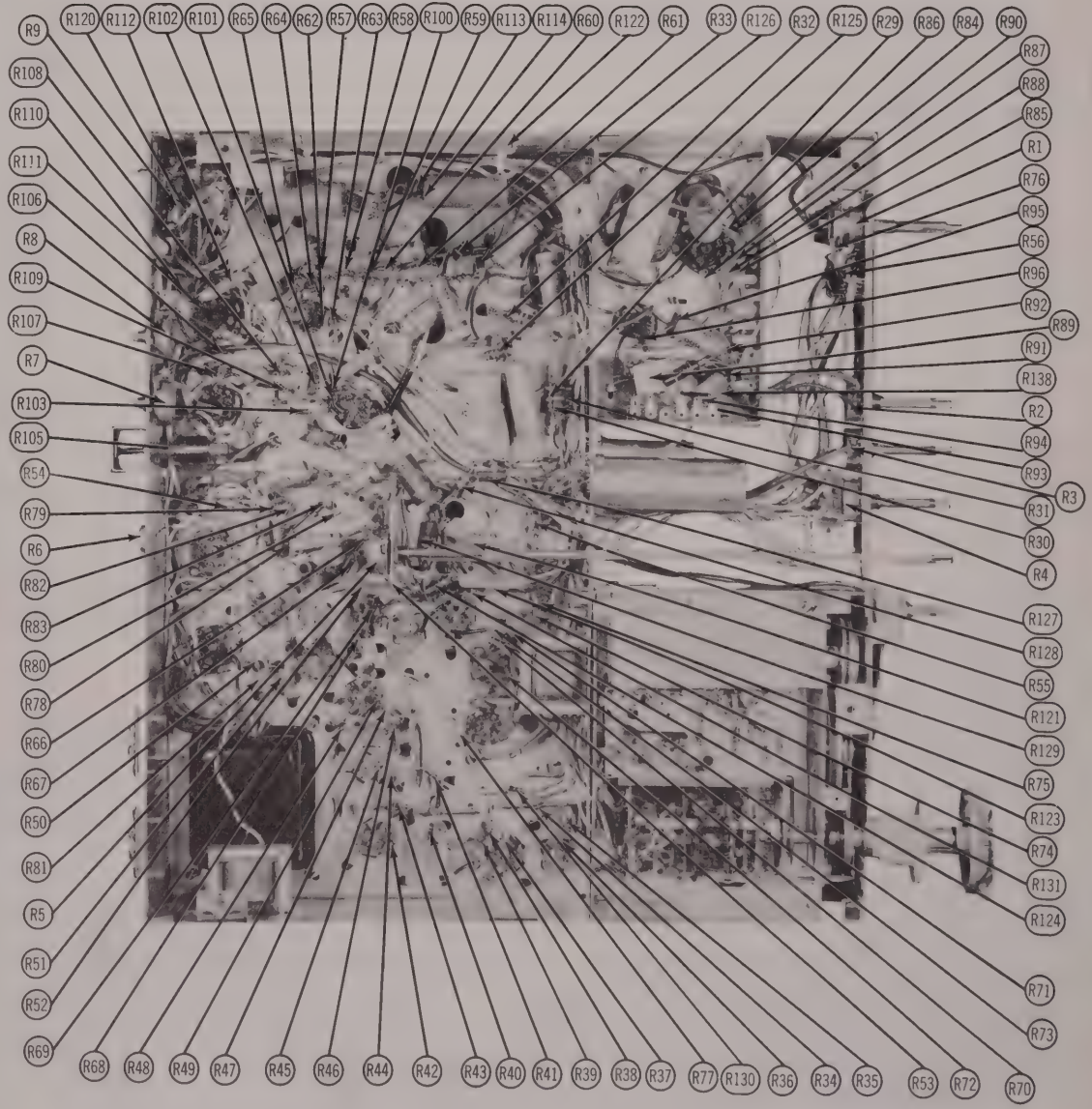
Centering is accomplished mechanically by means of a centering lever on PM focusing assembly. Adjust the centering lever from side to side, and up and down until the picture is properly centered.

ANTI-PIN CUSHION ADJUSTMENT

Reduce the picture size so that the sides of the raster are visible, and position the magnets so that all sides are straight lines and the corners are at right angles.

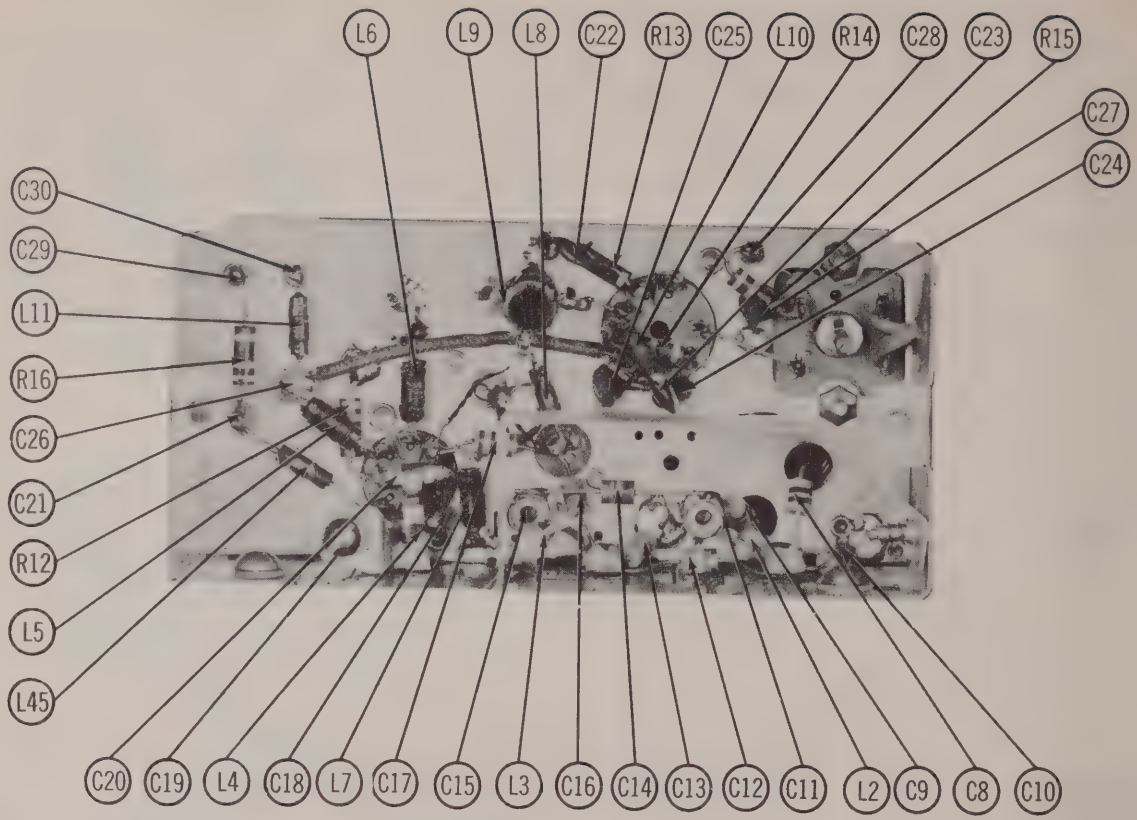
DISASSEMBLY INSTRUCTIONS

1. Remove 9 push on type control knobs from front panel.
2. Disconnect built-in antenna.
3. Remove 6 wood and 1 metal screws. Remove rear cover.
4. Disconnect speaker plug, yoke plug, CRT socket and HV plug.
5. Remove 1 bolt from yoke frame.
6. Remove 6 chassis bolts. Remove chassis.
7. Remove 4 speaker nuts. Remove speaker.

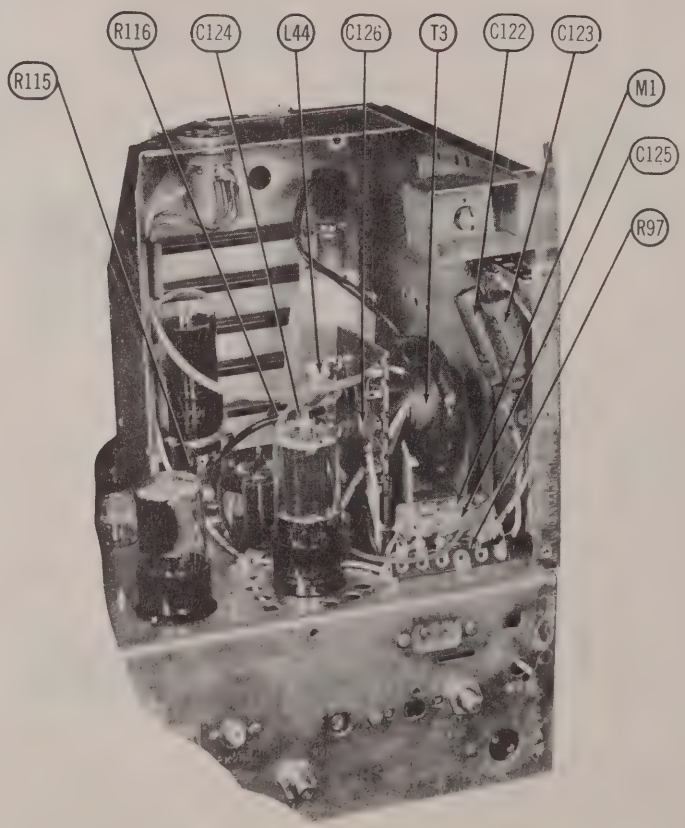


CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

3924 MEADE ST
DENVER, COLORADO



UHF TUNER-BOTTOM VIEW



HIGH VOLTAGE COMPARTMENT

BELL SOUND
MODELS 3717-MB, 3717-MB3

PROPERTY OF
DENVER, COLORADO

BELL SOUND
MODELS 3717-MB, 3717-MB3

BELL SOUND
MODELS 3717-MB, 3717-MB3

TRADE NAME	Bell Sound Models 3717-MB, 3717-MB3
MANUFACTURER	Bell Sound Systems Inc., 555 Marion Road, Columbus, Ohio
TYPE SET	AC-Battery Operated Mobile Audio Amp., with Single or 3 Speed Record Players
TUBES (Five)	Types 6SC7 Pre-Amp., 6SL7 AF Amp.-Phase Inv., (2) 6V6GT Audio Output, 6AX5 Rectifier
POWER SUPPLY	110-120 Volts AC (or) 6 Volt Storage Battery
RATING	.62 Amp. @ 117 VAC (or) 6 Amp. @ 6.3 VDC

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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PARTS LIST AND DESCRIPTIONS

BELL SOUND
MODEL 3717-MB

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA: Bell Sound PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RETMA BASE TYPE	NOTES
V1	AF Amplifier	6SC7	6SC7	8S	
V2	AF Amplifier-Phase Inverter	6SL7GT	6SL7GT	8BD	
V3	Audio Output	6V6GT	6V6GT	7S	
V4	Audio Output	6V6GT	6V6GT	7S	
V5	Rectifier	6AX5GT	6AX5GT	6S	

CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT	Bell Sound PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	▲20	450		AFH2-51		B040		FP234	TVL-2755	
B	■20	450		PRS50/50		BR505		TC39	TVA-1308	
C	50	50								
C2A	▲20	450		AFH2-51		B040		FP234	TVL-2755	
B	■20	450		PRS50/50		BR505		TC39	TVA-1308	Note 1
C	50	50								
C3	20	450		PRS450/20		BR2045A		TC75	TVA-1709	Note 1
C4	10000			BPD-01	MD-103	TM5S1	811-01	DC-511	5HK-S1	
C5	2000	500		1468-0002	D6-201	5W5T2	GP2K-201	MC-237	1FM-32	
C6	2000	500		1468-0002	D6-201	5W5T2	GP2K-201	MC-237	1FM-32	
C7	.01	600		P688-01	MD-502	PTE6S1	GP2-333-103	PT611	6TM-S1	
C8	2000	500		1468-0002	D6-201	5W5T2	GP2K-201	MC-237	1FM-32	
C9	.003	600		P688-003	D6-302	PTE6D3	GP2-333-302	PT623	6TM-D3	Note 2
C10	.01	600		P688-01	D6-103	PTE6S1	GP2-333-103	PT611	6TM-S1	
C11	.01	600		P688-01	D6-103	PTE6S1	GP2-333-103	PT611	6TM-S1	
C12	2000	500		1468-0002	D6-221	5W5T2	GP2K-201	MC-237	1FM-32	
C13	.01	600		P688-01	D6-103	PTE6S1	GP2-333-103	PT611	6TM-S1	
C14	.01	600		P688-01	D6-103	PTE6S1	GP2-333-103	PT611	6TM-S1	
C15	.02	600		P688-02	DD-203	PTE6S2		PT612	6TM-S2	
C16	.05	2000		P2089-05				0T467	PX-152	
C17	.5	400		P488-5		MP2P5		PT405	4TM-P5	
C18	.25	200		P488-25		PTE4P25		PT4025	2TM-P25	
C19	.25	200		P488-25		PTE4P25		PT4025	2TM-P25	

Note 1. Some Models replace C3 with C2C, 50MFD @ 50V.
Note 2. Some Models use a .002MFD @ 600V in this application.

RESISTORS

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA: Bell Sound PART No.	REPLACEMENT DATA: IRC PART No.	NOTES
R4	3.3Meg	1/2		BTS-3.3Meg	
R5	1000Ω	1/2		BTS-1000	
R6	270KΩ	1/2		BTS-270K	
R7	270KΩ	1/2		BTS-270K	
R8	27KΩ	1/2		BTS-27K	
R9	100KΩ	1/2		BTS-100K	
R10	270KΩ	1/2		BTS-270K	
R11	100KΩ	1/2		BTS-100K	
R12	27KΩ	1/2		BTS-27K	
R13	270KΩ	1/2		BTS-270K	
R14	1500Ω	1/2		BTS-1500	
R15	100KΩ	1/2		BTS-100K	Note 1
R16	3300Ω	1/2		BTS-3300	
R17	130KΩ	1/2			

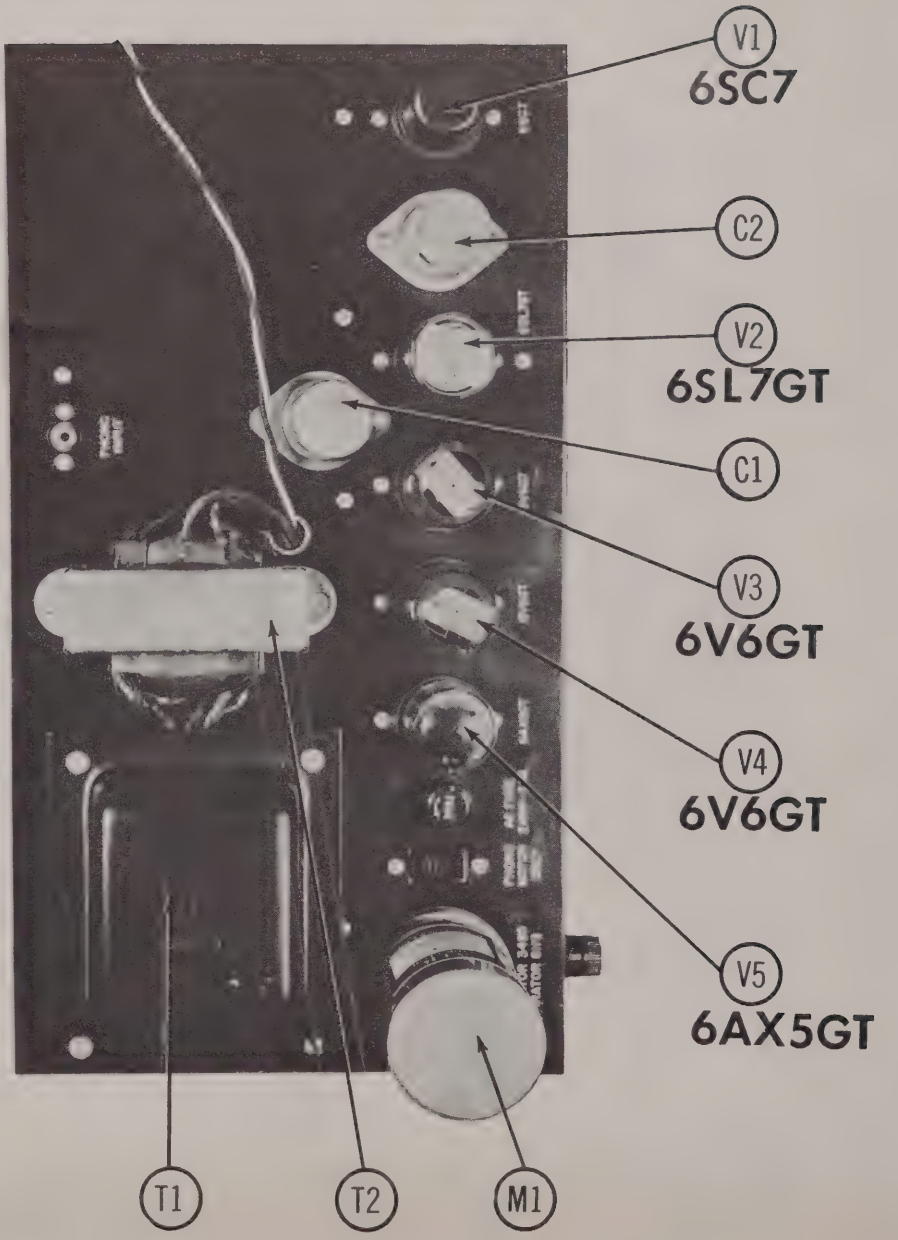
ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA: Bell Sound PART No.	REPLACEMENT DATA: IRC PART No.	NOTES
R18	1.2Meg	1/2		BTS-1.2Meg	Note 2
R19	130KΩ	1/2			Note 3
R20	27KΩ	1/2		BTS-27K	
R21	270KΩ	1/2		BTS-270K	
R22	250Ω	5		1 3/4A-260	
R23	270KΩ	1/2		BTS-270K	
R24	100KΩ	2		BTB-100K	
R25	2700Ω	2		BTB-2700	
R26	6800Ω	1/2		BTS-6800	
R27	82Ω	1/2		BTS-82	
R28	120Ω	1/2		BTS-120	
R29	.1Ω	20			Note 4
R30	25Ω	5		1 3/4A-25	

Note 1. Some models may use a 130KΩ resistor in this application.
Note 2. Some models may use a 1.5Meg resistor in this application.
Note 3. Some models may use a 100KΩ resistor in this application.
Note 4. Not used in all models.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA: Bell Sound PART No.	REPLACEMENT DATA: IRC PART No.	REPLACEMENT DATA: CLAROSTAT PART No.	REPLACEMENT DATA: CENTRALAB PART No.	REPLACEMENT DATA: MALLORY PART No.	INSTALLATION NOTES
R1A	500KΩ	1/2	B-20066P-59	Q13-133	AG-60-Z	B-60	U-48	Phono Volume
B	Shaft		Not Req.	Not Req.	RS-2	Not Req.	Not Req.	Attach to R1A
R2A	500KΩ	1/2	B-20066P-59	Q13-133	AG-60-Z	B-60	U-48	Mike volume
B	Shaft		Not Req.	Not Req.	RS-2	Not Req.	Not Req.	Attach to R2A
R3A	500KΩ	1/2		Q13-133	AG-60-Z	B-60-S	U-48	Tone
B	Shaft			Not Req.	RS-2	Not Req.	Not Req.	Attach to R3A
C	Switch			76-2	SWB-2	Not Req.	US-27	Attach to R3A

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	Bell Sound PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	RCA TYPE No.	Halldorson PART No.	Thordarson PART No.
T1	117VAC @ .62A or 6.3VDC @ 3.5A	670VCT .093ADC	6.3VAC @ 3.5A	B-20240						

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	Bell Sound PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.	
T2	5.8KΩ CT	500Ω tap @ 70V, 250Ω, 200Ω, 15Ω, 8Ω, 4Ω 2Ω	B-20056-7						

VIBRATOR

ITEM No.	TYPE	INPUT VOLTS	FRE-QUENCY	REPLACEMENT DATA				NOTES
				Bell Sound PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	RADIART PART No.	
M1	Interrupter	6.3V	60		3485		3485	

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA							REMARKS
	Bell Sound PART No.	ASTATIC PART No.		SHURE PART No.		ELECTRO-VOICE PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	
M2A		L-70-A		W58A		12	0-3 or S-3	Model 3717-MB
		♦WL-70						♦ Complete arm & cart. assembly
B		LQD-1J	"Q" Q-33			96.0	0-1	
		♦ W-14L3D						

ASTATIC AND ELECTRO-VOICE NEEDLE LISTINGS SHOWN ABOVE ARE SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGES LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENT SEE BELOW.

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA			REMARKS
	Bell Sound PART No.	WALCO PART No.	JENSEN PART No.	
M3A B		WS400 W-2MGA or W-2MGS and W-2A or W-2S	J-10 A-80LP or A-81LP and A-80 or A-81	Model 3717-MB Model 3717-MB3

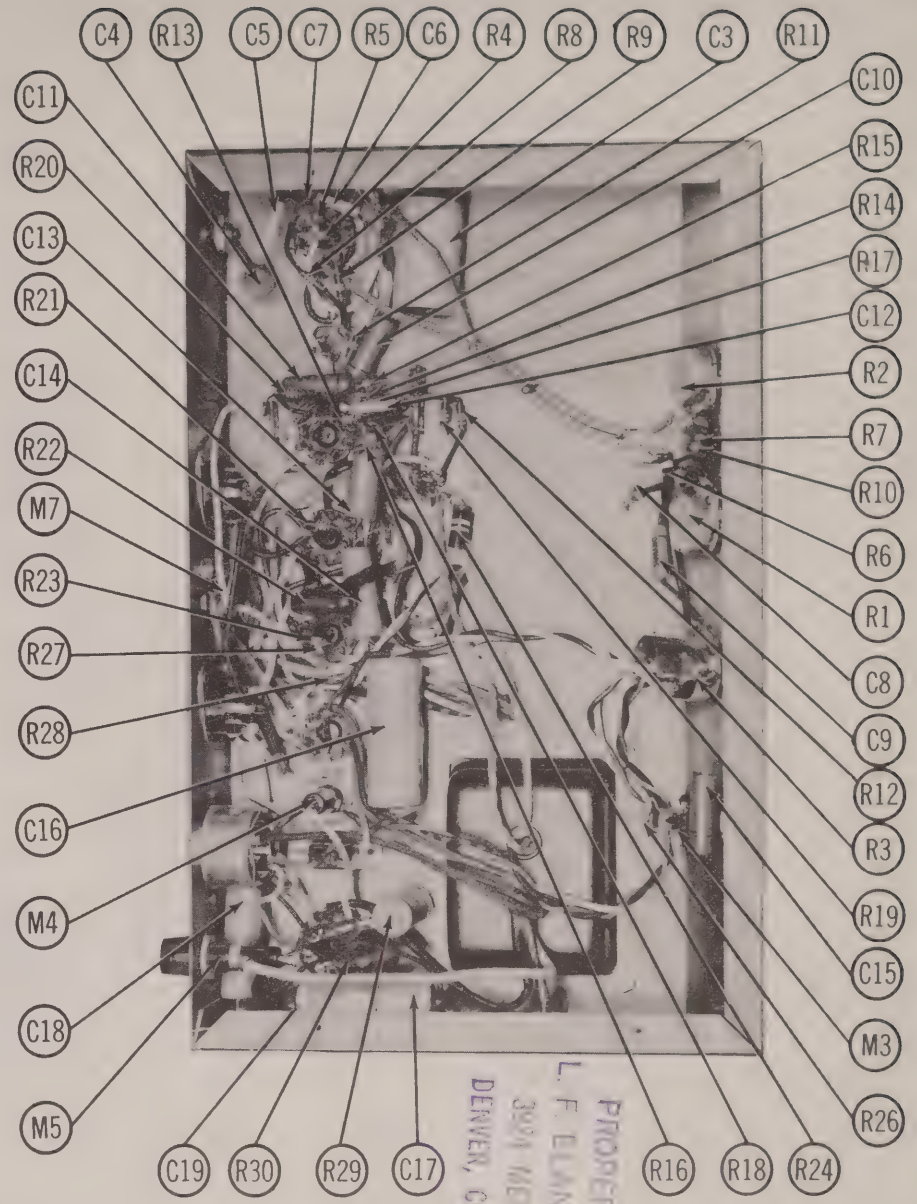
FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			Bell Sound PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M4	3AG	2 Amp. 250V			312002.	342001	AGC2	HKP
M5	SFE	20 Amp.			307020.	342001	SFE20	HKP

MISCELLANEOUS

ITEM No.	PART NAME	Bell Sound PART No.	NOTES
M6	Pilot light		Type # 51
M7	Switch		Output selector
M8	Switch		Stand-by

CHASSIS—BOTTOM VIEW



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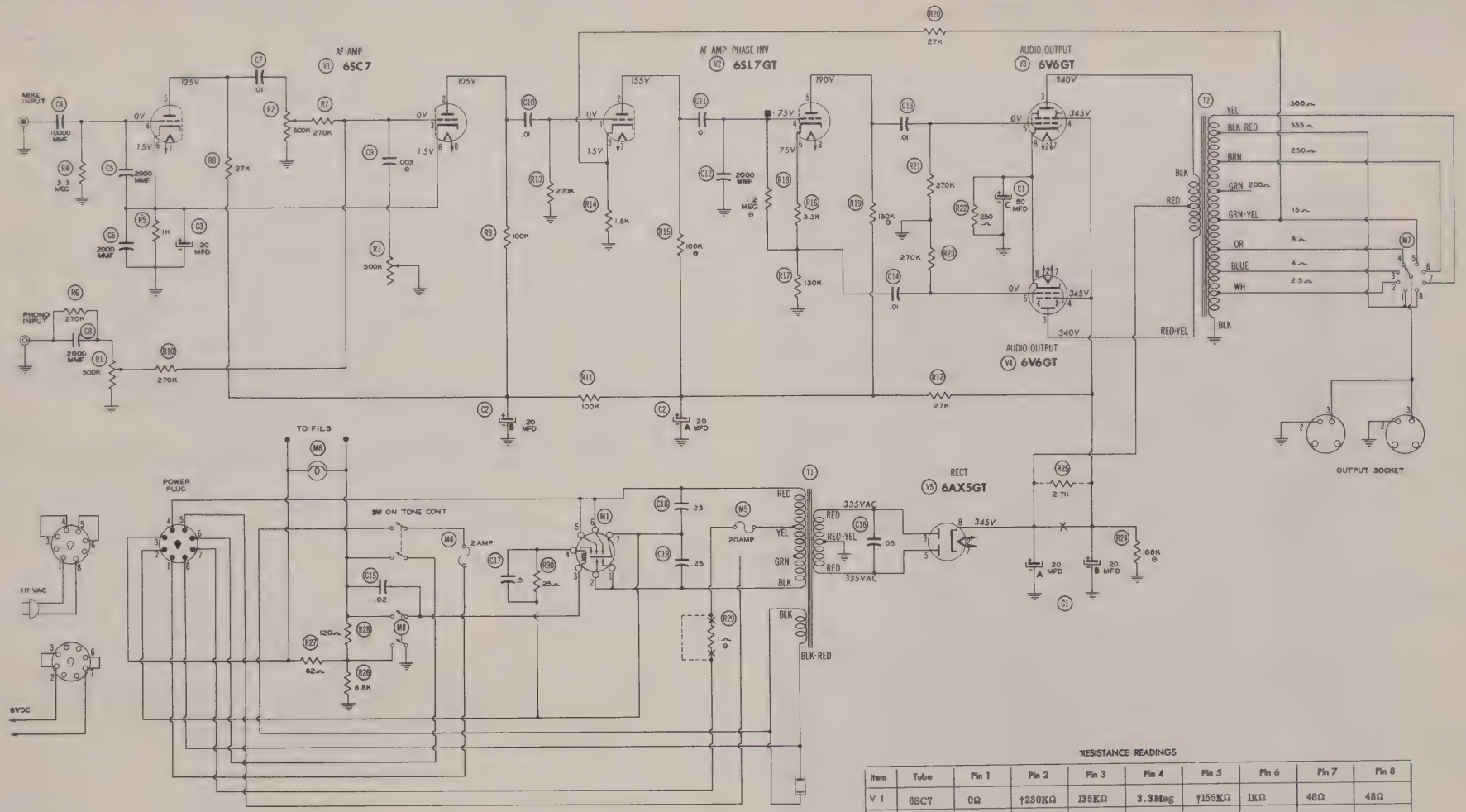
DENVER, COLORADO

BELL SOUND MODEL 3717-MB



RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 1	6SC7	0Ω	†230KΩ	135KΩ	3.3Meg	†155KΩ	1KΩ	48Ω	48Ω
V 2	6SL7GT	270KΩ	†130KΩ	1.4KΩ	1.3Meg	†160KΩ	130KΩ	48Ω	48Ω
V 3	6V6GT	0Ω	48Ω	†110Ω	†0Ω	270KΩ	INF	48Ω	250Ω
V 4	6V6GT	0Ω	48Ω	†114Ω	†0Ω	270KΩ	48Ω	48Ω	250Ω
V 5	6AX5GT	INF	48Ω	85.8Ω	INF	78Ω	INF	48Ω	100KΩ

ALL MEASUREMENTS TAKEN WITH STANDBY SWITCH IN "ON" POSITION AND WITH 117VAC INPUT
■ MEASURED FROM PIN 6 OF V2.
† MEASURED FROM PIN 8 OF V5

THE COOPERATION OF THE MANUFACTURER OF THIS EQUIPMENT MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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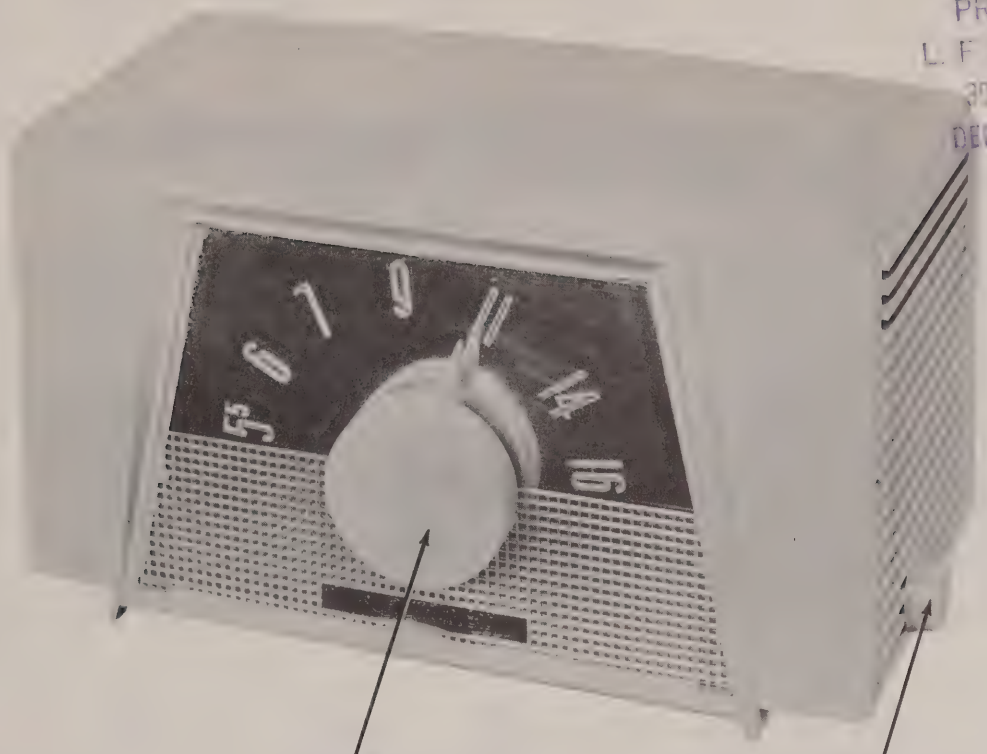

CAVALIER
MODEL 5B1

TRADE NAME	Cavalier Model 5B1
MANUFACTURER	Hinners Galanek Radio Corp., 2514 Broadway, Long Island City 6, N.Y.
TYPE SET	AC-DC Operated AM Superheterodyne Receiver
TUBES (Five)	Types 12BE6 Conv., 12BA6 IF Amp., 12AT6 Det.-AVC-AF Amp., 50C5 Audio Output, 35W4 Rectifier
POWER SUPPLY	110-120 Volts AC-DC RATING .2 Amp. @ 117 VAC
TUNING RANGE—BROADCAST	535-1620KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 7 (grid) of 12BE6 (V1). Low side to B-.	455KC (400~Mod)	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.		Loop	1620Kc	"	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		"	1400KC	"	"	A6	"

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PARTS LIST AND DESCRIPTIONS

CAVALIER MODEL 5B1

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA		RETMA BASE TYPE	NOTES
		CAVALIER PART No.	STANDARD REPLACEMENT		
V1	Converter	12BE6	12BE6	7CH	
V2	IF Amplifier	12BA6	12BA6	7BK	
V3	Det-AVC-AF Amp.	12AT6	12AT6	7BT	
V4	Audio Output	50C5	50C5	7CV	
V5	Rectifier	35W4	35W4	5BQ	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	CAVALIER PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	70	150		PRS150/50-30-20		BBRD8415		3N536	TVA-2460	Red
B	30	150								Blue
C2	.05	200		P288-05	DF-503	CUB2S5		PT415	2TM-S5	
C3	100	500		1468-0001	D6-101	5W5T1	GP1K-101	MC235	1FM-31	
C4	.0022	400		P688-0022	D6-222	CUB6D22	GP2-333-222	PT6222	6TM-D22	
C5	330	500		SI330	D6-331	5W5T33	GP2K-331	UC-5333	5GA-T33	
C6	10000			BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C7	20000			BPD-02	DF-203	K085	817-02	PT612	5HK-S2	
C8	.033	600		P688-033		CUB6S3		PT6133	6TM-S3	
C9	.05	200		P288-05	DF-503	CUB2S5		PT415	2TM-S5	

CONTROLS

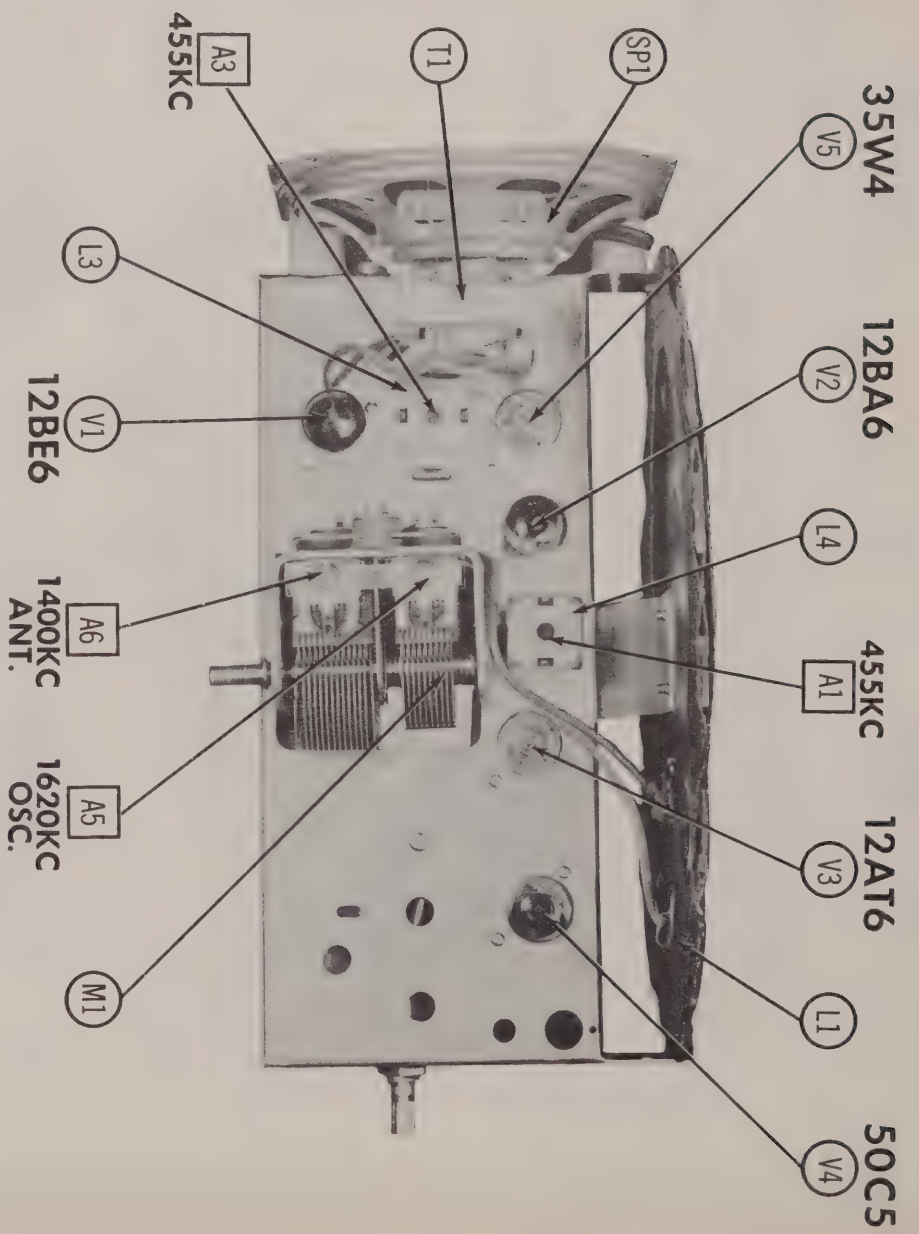
ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	CAVALIER PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1A	500K	½	120-106	Q13-133	AG-60-Z	BSK-60-S	U-48	Volume
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Not Req.	Attach to R1A
C	Switch		Not Req.	76-1	SWB	Not Req.	US-26	Attach to R1A

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	CAVALIER PART No.	IRC PART No.	
R2	22KΩ	½		BTS-22K	
R3	47KΩ	½		BTS-47K	
R4	2.2Meg	½		BTS-2.2Meg	
R5	10 Meg	½		BTS-10 Meg	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	PART No.	IRC PART No.	
R6	240KΩ	½		BTS-240K	
R7	330KΩ	½		BTS-330K	
R8	2200Ω	1		BTA-2200	
R9	25Ω	½			

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	CAVALIER PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.	
T1	2.4KΩ	3.4Ω		A-3332 ①	A-3025 ①	S-1X ①	Z1101 ①	TS-24S50 ①	① Bend mounting tabs down, file out slots, mount on original mounting bracket.

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	CAVALIER PART No.	JENSEN PART No.	QUAM PART No.	
SP1	4"	PM	3.4Ω		ST-113 Mod. P4-X	4A07	

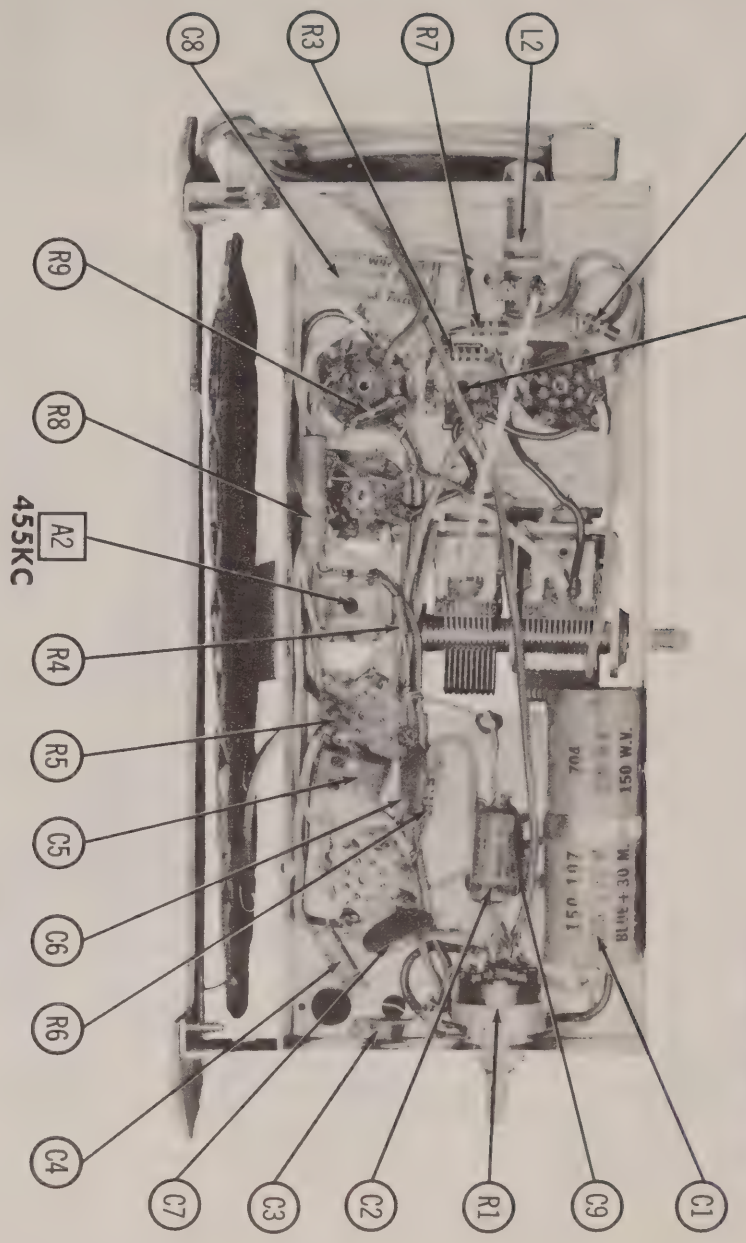
COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	CAVALIER PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Loop Ant.	1.1Ω						
L2	Osc. Coil	.5Ω	5.5Ω		14-1073		69 Osc.	
L3	Input IF	18Ω	18Ω	130-102	16-6758	BC-352	12-C1	
L4	Output IF	18Ω	18Ω	130-102	16-6758	BC-353	12-C2	

MISCELLANEOUS

ITEM No.	PART NAME	CAVALIER PART No.	NOTES
M1	Tuning cap	160-104	2 section (34-457MMF(37-200MMF)

CHASSIS—BOTTOM VIEW



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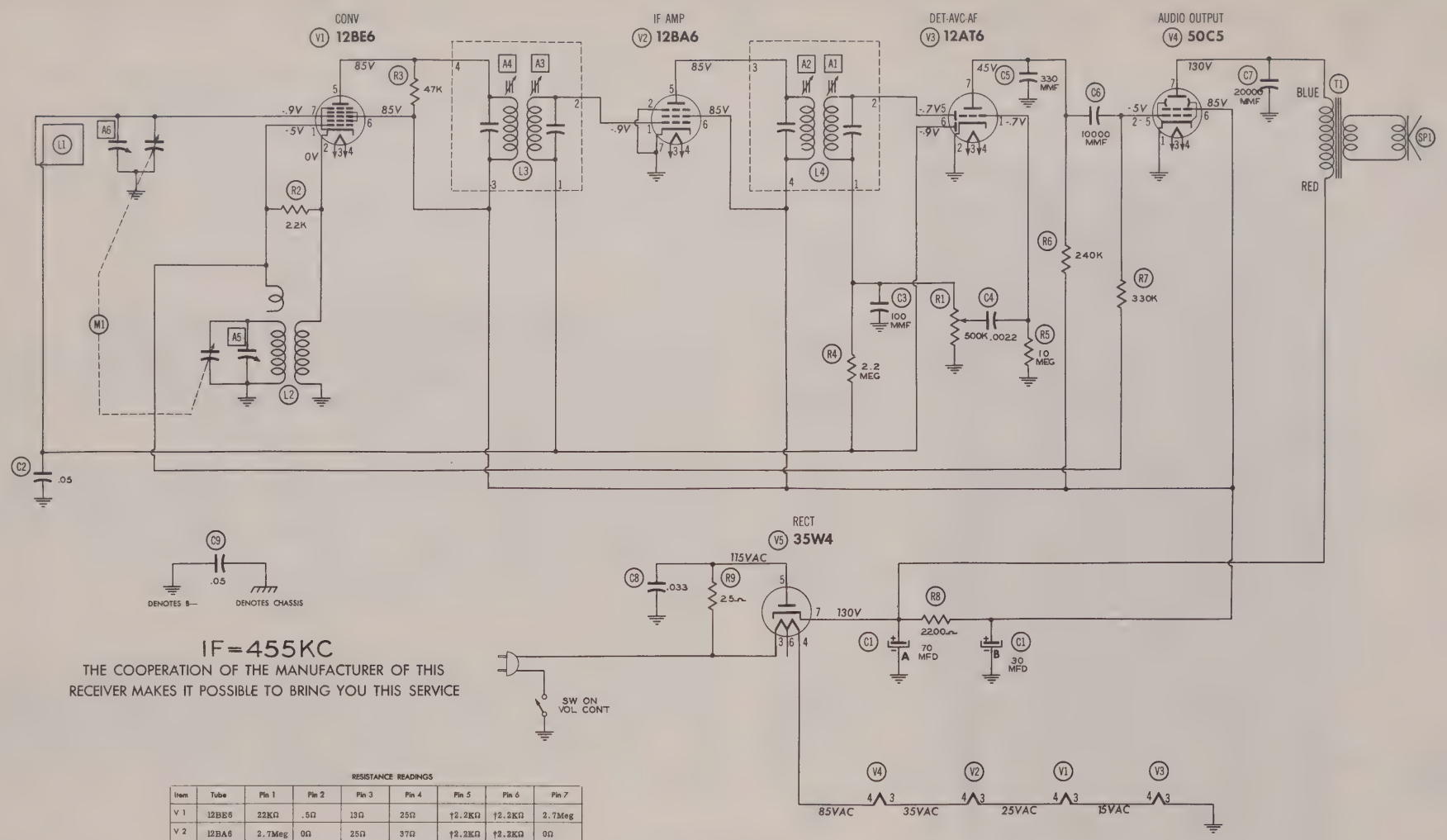

IF=455KC

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	12BE6	22KΩ	.5Ω	13Ω	25Ω	†2.2KΩ	†2.2KΩ	2.7Meg
V 2	12BA6	2.7Meg	0Ω	25Ω	37Ω	†2.2KΩ	†2.2KΩ	0Ω
V 3	12AT6	10Meg	0Ω	0Ω	13Ω	500KΩ	2.7Meg	†240K Ω
V 4	50C5	0Ω	350KΩ	37Ω	86Ω	350KΩ	†2.2KΩ	†150Ω
V 5	35W4	0Ω	350KΩ	135Ω	86Ω	142Ω	95Ω	200KΩ

† MEASURED FROM PIN 7 OF V5.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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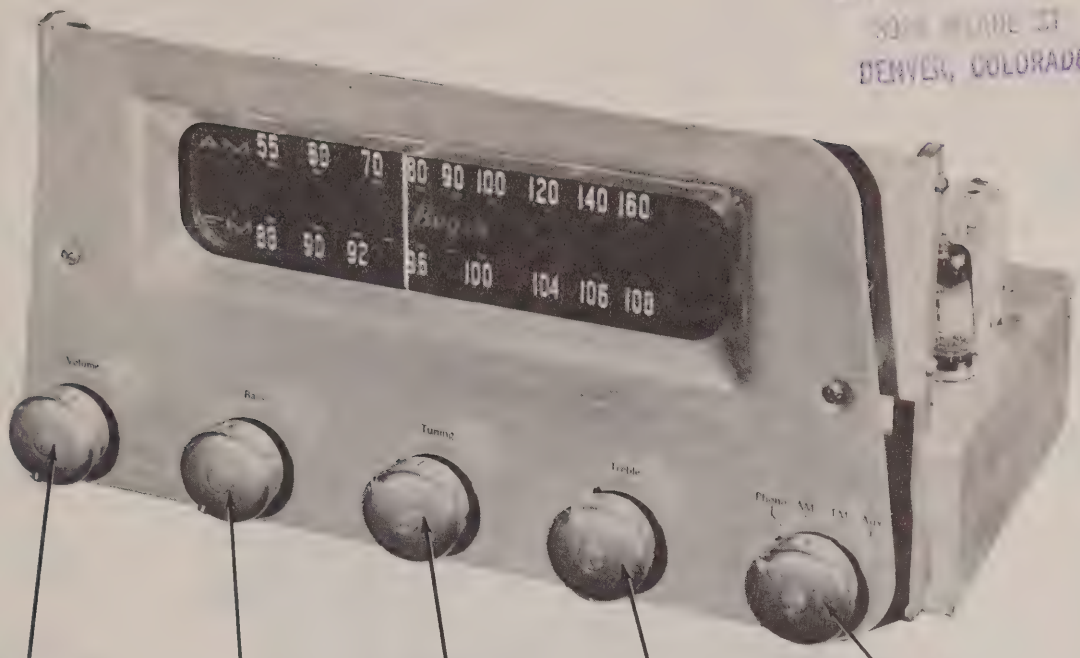
DENVER, COLORADO

DAVID BOGEN
MODEL R300


AM 55 60 70 80 90 100 120 140 160
FM 88 90 92 96 100 104 106 108
VOLUME CONTROL ON-OFF SWITCH
BASS CONTROL
TUNING CONTROL
TREBLE CONTROL
FUNCTION SELECTOR SWITCH

DAVID BOGEN
MODEL R300

TRADE NAME	David Bogen Model R300	
MANUFACTURER	David Bogen Co., Inc., 29 Ninth Ave., New York, N.Y.	
TYPE SET	AC Operated AM-FM Superheterodyne Tuner For Custom Installations	
TUBES	Ten	
POWER SUPPLY	110-120 Volts AC	RATING .32 Amp. @ 117 Volts AC
TUNING RANGE - BROADCAST	530-1650KC	FREQ. MOD. 88-108MC

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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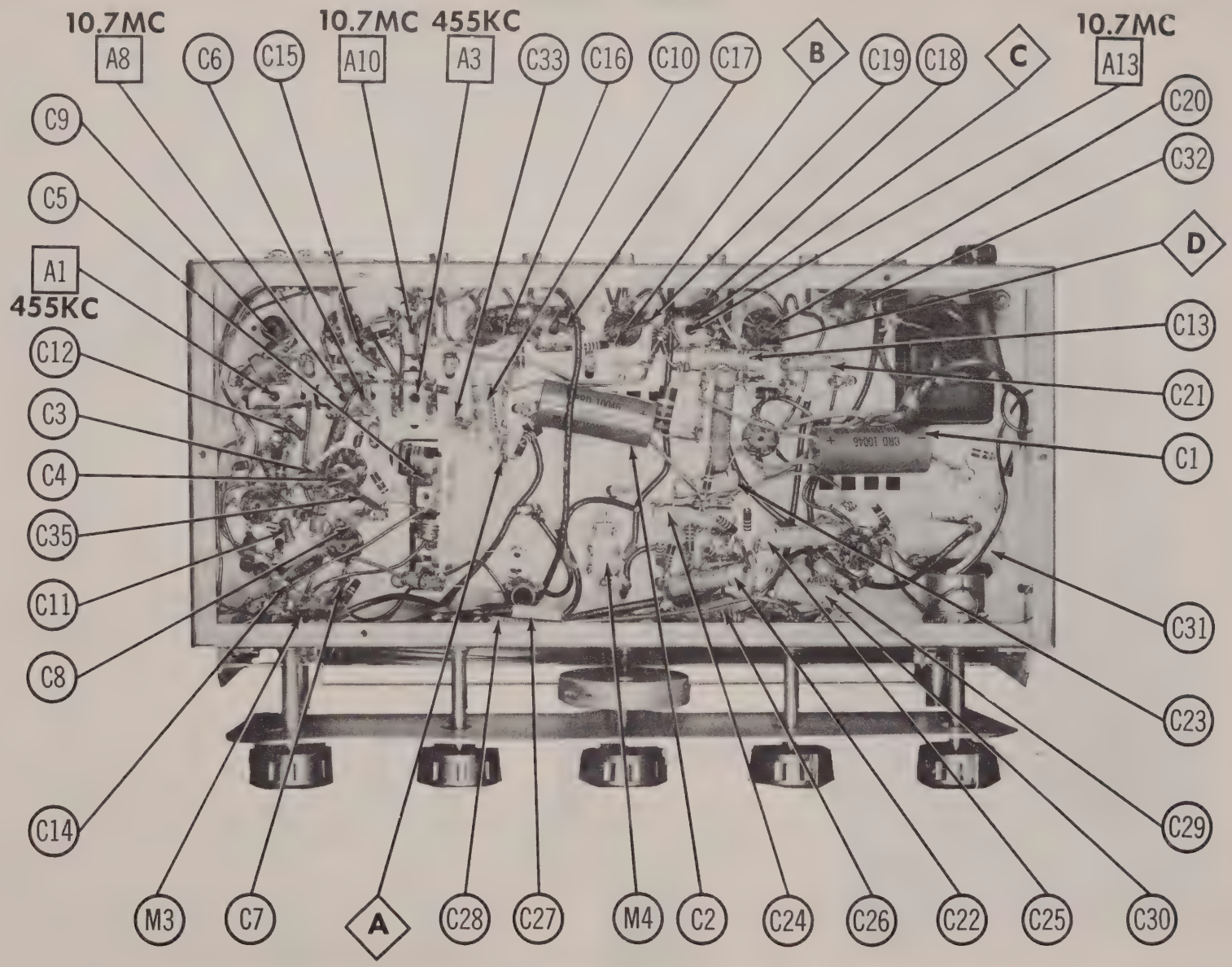
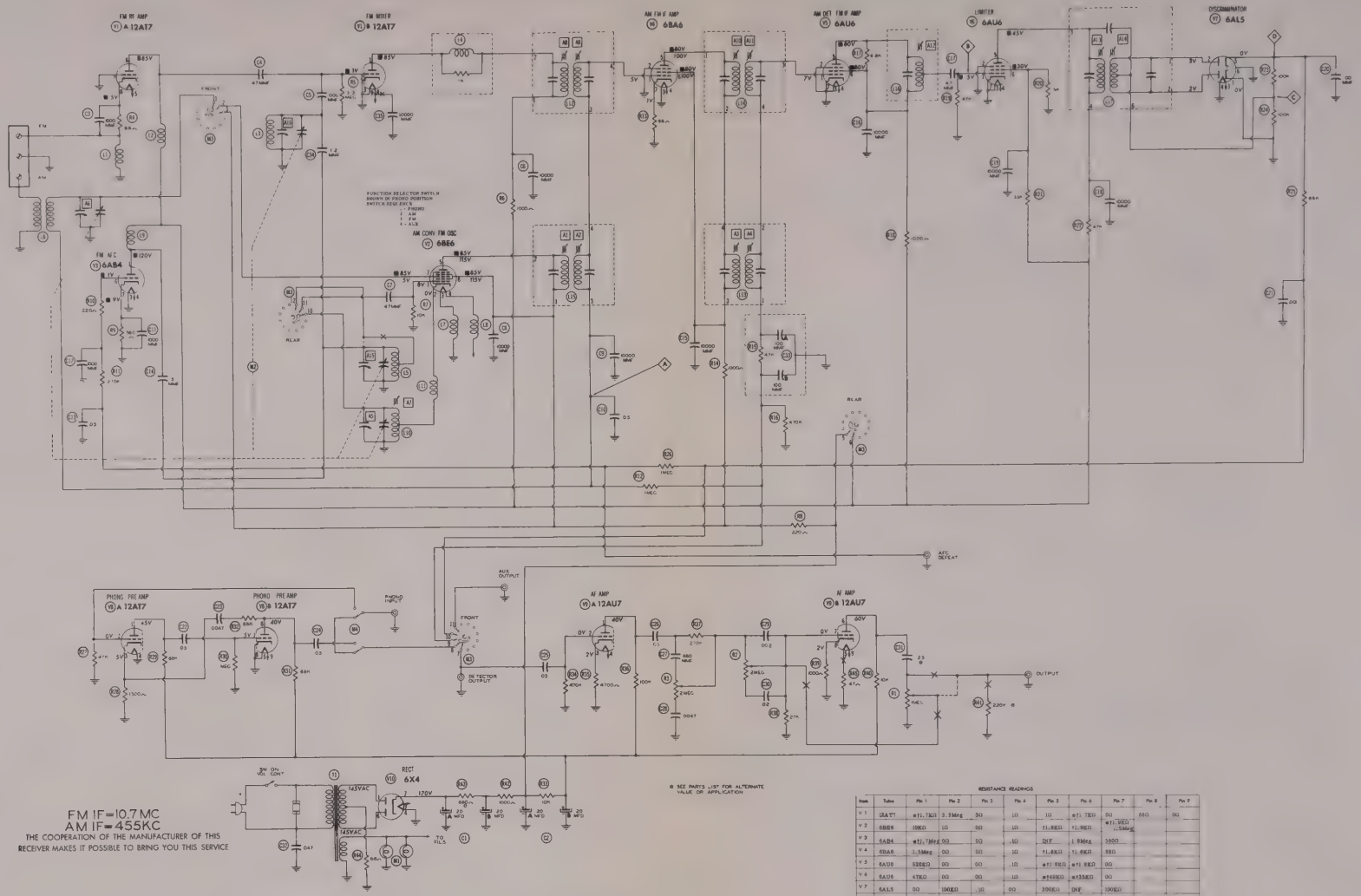


CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION



FM IF=10.7 MC
AM IF=455 KC

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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1 DC voltage measurements taken with vacuum tube voltmeter
AC voltages measured at 1000 ohms per volt
2 Socket connections are shown as bottom view
3 Measured in set with tube socket grid resistor removed
4 Line voltage should be set for voltage read ings
5 Measurements are component values unless otherwise noted
Tolerance of ±10% on voltage and resistance readings
6 Volume control at maximum, no signal applied for voltage measurements

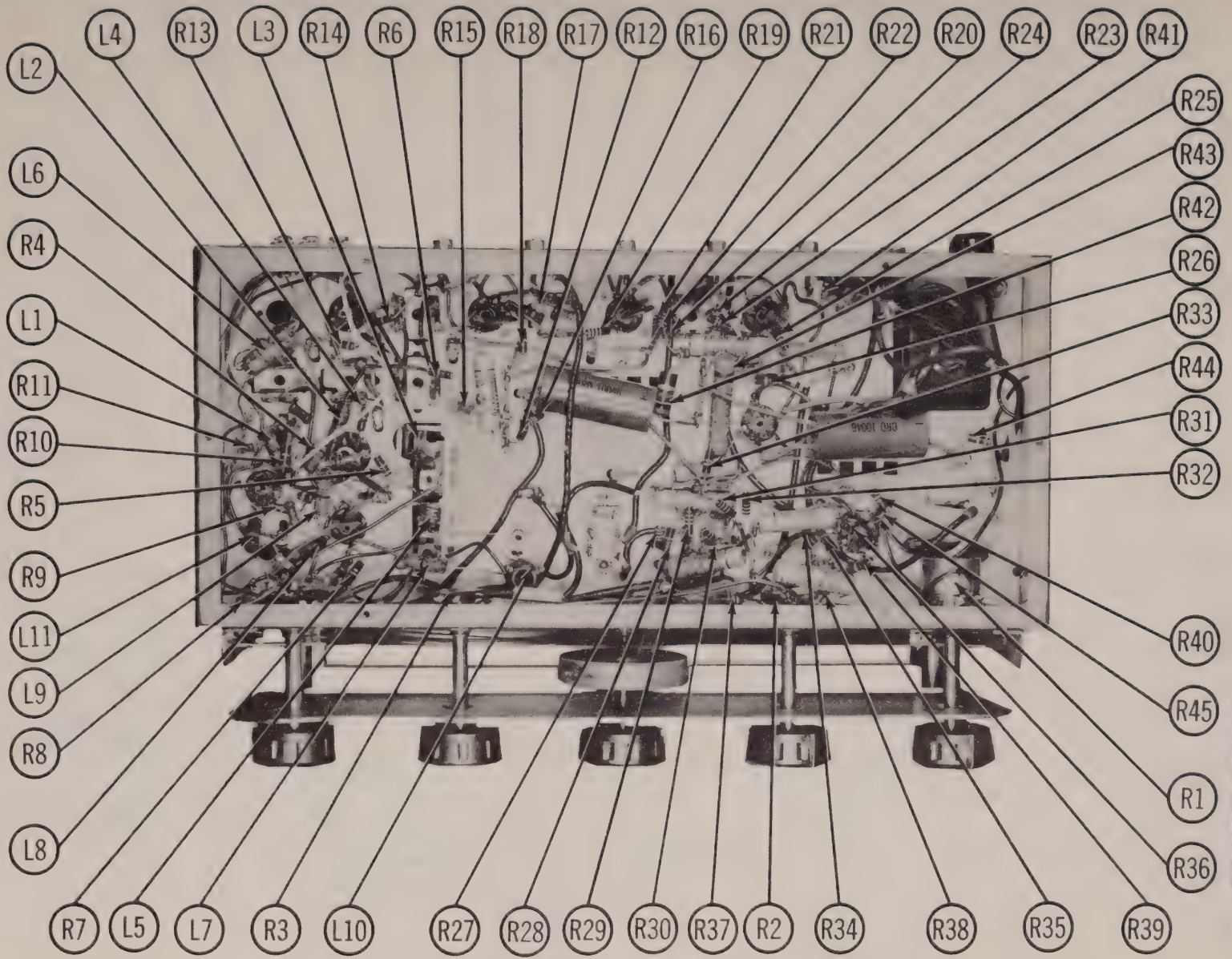
⊕ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	12AT7	ø11.7KΩ	3.3Meg	0Ω	1Ω	1Ω	ø11.7KΩ	0Ω	68Ω	0Ω
V 2	6BE6	100KΩ	1Ω	0Ω	1Ω	11.8KΩ	11.8KΩ	ø11.9KΩ 1.5Meg		
V 3	6AB4	ø11.7MEG	0Ω	0Ω	1Ω	INF	1.5Meg	100Ω		
V 4	6BA6	1.5Meg	0Ω	0Ω	1Ω	11.8KΩ	11.8KΩ	58Ω		
V 5	6AU6	520KΩ	0Ω	0Ω	1Ω	ø12.8KΩ	ø11.8KΩ	0Ω		
V 6	6AU6	47KΩ	0Ω	0Ω	1Ω	ø140KΩ	ø135KΩ	0Ω		
V 7	6AL5	0Ω	100KΩ	1Ω	0Ω	200KΩ	INF	100KΩ		
V 8	12AT7	100KΩ	47KΩ	1.5KΩ	0Ω	0Ω	190KΩ	1Meg	0Ω	1Ω
V 9	12AU7	410KΩ	470KΩ	4.7KΩ	1Ω	1Ω	135KΩ	900KΩ	1KΩ	47Ω
V 10	6X4	180Ω	INF	1Ω	0Ω	INF	170Ω	80KΩ		

READINGS IN AM POSITION UNLESS OTHERWISE NOTED
⊕ MEASURED IN FM POSITION
1 MEASURED FROM PIN 7 OF V10

238-7



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

PROPERTY OF
L. F. DLANKENSHIP
DENVER, COLORADO

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

AM ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
1.	.01MFD	High side to pin 7 (grid) of 6BE6 (V2). Low side to chassis.	455KC (Unmod)	AM	1600KC	DC probe to point (A). Common to chassis.	A1, A2, A3, A4	Adjust for maximum deflection.
2.	200MMF	High side thru 200MMF to AM antenna terminal. Low side to chassis.	1600KC	"	"	"	A5, A6	"
3.	"	"	600KC	"	600KC	"	A7	Adjust for maximum deflection while rocking tuning gang thru 600KC signal.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Use 100KΩ resistor in series with DC probe of VTVM.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
4.	.01MFD	High side to pin 2 (grid) of 12AT7 (V1). Low side to chassis.	10.7MC (Unmod.)	FM	Point of non-interference	DC probe to point (B). Common to chassis.	A8, A9, A10, A11 A12	Adjust for maximum deflection.
5.	"	"	"	"	"	DC probe to point (C). Common to chassis.	A13	"
6.	"	"	"	"	"	DC probe to point (D). Common to chassis.	A14	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60~ modulation and 450KC sweep. Use 120~ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
4.	.01MFD	High side to pin 2 (grid) of 12AT7 (V1). Low side to chassis.	10.7MC (450KC Swp)	FM	Point of non-interference	Vert. Amp. thru 10KΩ to point (B). Low side to chassis.	A8, A9, A10, A11, A12	Adjust for curve of maximum amplitude and symmetry similar to Fig. 1.
5.	"	"	"	"	"	Vert. Amp. thru 10KΩ to point (C). Low side to chassis.	A13	"
6.	"	"	"	"	"	Vert. Amp. thru 10KΩ to point (D). Low side to chassis.	A14	Adjust so that 10.7MC occurs at center of crossover lines as in Fig. 2. SLIGHTLY retouch A13 for maximum amplitude and straightness of crossover lines.

FM RF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
7.	300Ω Carbon Resistor	High side thru 300Ω to FM antenna terminal. Low side to chassis.	106MC	FM	106MC	DC probe to point (B). Common to chassis.	A15, A16	Adjust for maximum deflection. Check tracking at 90MC. If necessary, repeat step 7.

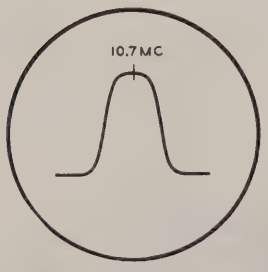


FIG. 1

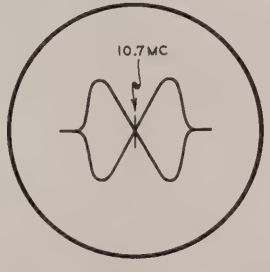


FIG. 2

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA		RETMA BASE TYPE	NOTES
		David Bogen PART No.	STANDARD REPLACEMENT		
V1	FM RF Amplifier - FM Mixer	12AT7	12AT7	9A	
V2	AM Converter - FM Oscillator	6BE6	6BE6	7CH	
V3	FM AFC	6AB4	6AB4	5CE	
V4	AM FM IF Amp.	6BA6	6BA6	7BK	
V5	AM Detector - FM IF Amplifier	6AU6	6AU6	7BK	
V6	Limiter	6AU6	6AU6	7BK	
V7	Discriminator	6AL5	6AL5	6BT	
V8	AF Amplifier	12AT7	12AT7	9A	
V9	AF Amplifier	12AU7	12AU7	9A	
V10	Rectifier	6X4	6X4	5BS	

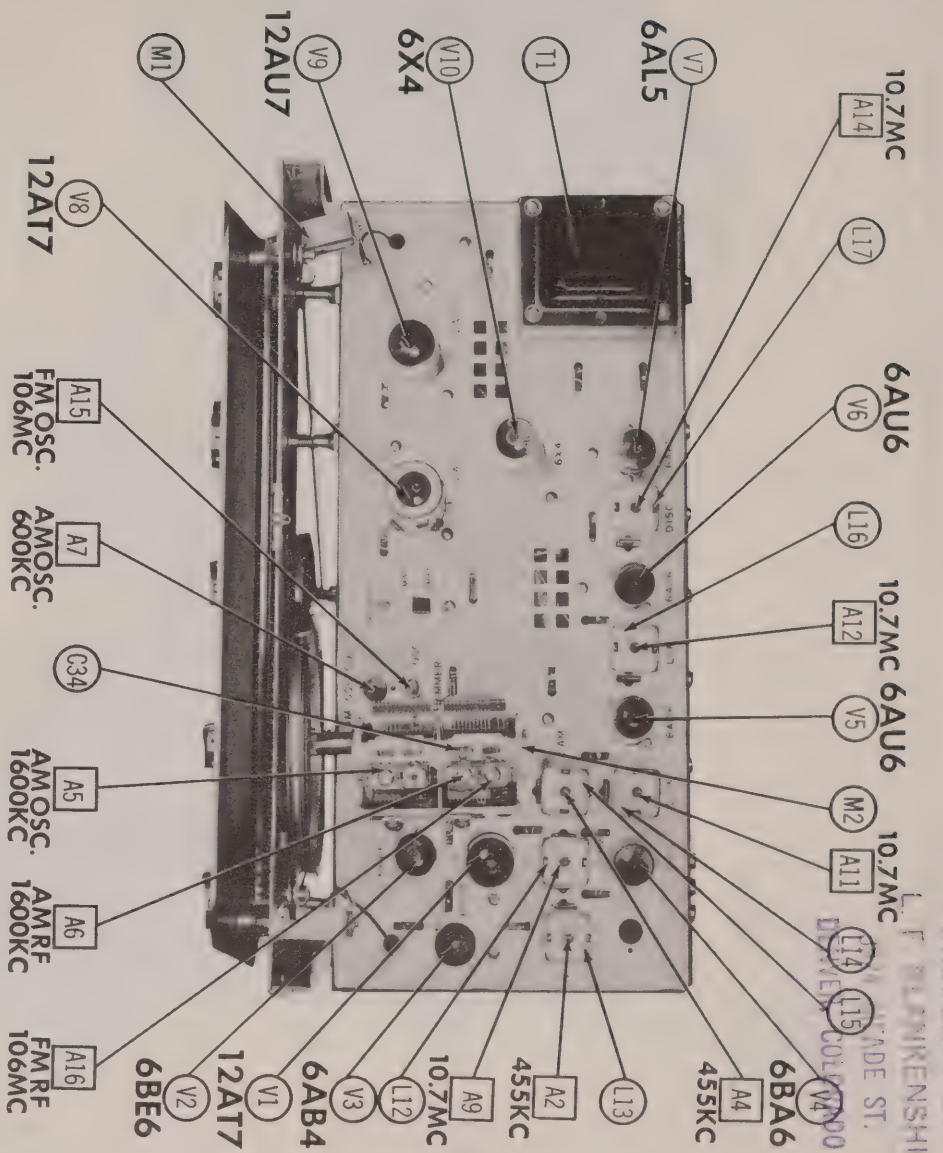
CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	David Bogen PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	20	150		PRS150/20-20		BRD2215		2N509	TVA-2428	Red
B	20	150								
C2A	20	150		PRS150/20-20		BRD2215		2N509	TVA-2428	
B	20	150								
C3	1000			SI1000	D6-102	TM5D1	GP2L-102	UC-521	5GA-D1	
C4	47			SI47	D6-470		GP1K-470	UC-5447	5GA-Q47	
C5	1000			SI1000	D6-102	TM5D1	GP2L-102	UC-521	5GA-D1	
C6	10000			BPD-01	DD-103	TM5S1	811-01	DC-511	5HK-S1	
C7	47			SI47	D6-470		GP1K-470	UC-5447	5GA-Q47	
C8	10000			BPD-01	DD-103	TM5S1	811-01	DC-511	5HK-S1	
C9	10000			BPD-01	DD-103	TM5S1	811-01	DC-511	5HK-S1	
C10	.05	200		P288-05	DF-503	PJ2S5		PT415	2TM-S5	
C11	1000			SI1000	D6-102	TM5D1	GP2L-102	UC-521	5GA-D1	
C12	1000			SI1000	D6-102	TM5D1	GP2L-102	UC-521	5GA-D1	
C13	.05	200		P288-05	DF-503	PJ2S5		PT415	2TM-S5	
C14	5			SI5	D6-050		GP1K-050	NT-555	5GA-V5	
C15	10000			BPD-01	DD-103	TM5D1	811-01	DC-511	5HK-S1	
C16	10000			BPD-01	DD-103	TM5D1	811-01	DC-511	5HK-S1	
C17	47			SI47	D6-470		GP1K-470	UC-5447	5GA-Q47	
C18	10000			BPD-01	DD-103	TM5S1	811-01	DC-511	5HK-S1	
C19	10000			BPD-01	DD-103	TM5S1	811-01	DC-511	5HK-S1	
C20	100			SI100	D6-101	TM5T1	GP1K-101	UC-531	5GA-T1	
C21	.001	200		P288-001	D6-102	PJ2D1	GP2L-102	PT421	2TM-D1	
C22	.05	200		P288-05	DF-503	PJ2S5		PT415	2TM-S5	
C23	.0047	400		P488-0047	D6-472	PTE4D47	GP2-333-472	PT4247	4TM-D47	
C24	.05	400		P488-05	DF-503	PTE4S5		PT415	4TM-S5	
C25	.05	200		P288-05	DF-503	PJ2S5		PT415	2TM-S5	
C26	.05	200		P288-05	DF-503	PJ2S5		PT415	2TM-S5	
C27	680	500								Note 1
C28	.0047	200		P288-0047	D6-472	PJ2D47	GP2-333-472	PT4247	4TM-D47	
C29	.002	200		P288-002	D6-202	PJ2D2	GP2-333-202	PT422	2TM-D2	
C30	.02	600		P688-02	DF-203	PTE6S2		PT612	6TM-S2	
C31	.25	600		P688-25		PTE6P25		PT6025	6TM-P25	Note 2
C32	.047	400		489ZX-047		PJ4S47		PT4147	4TM-S47	
C33A	100			♦PA-97	♦PC-50	TM5T1	♦1403-01	UC-531	♦100C1	
B	100					TM5T1		UC-531		
C34	1.2									
C35	10000			BPD-01	DD-103	TM5S1	811-01	DC-511	5HK-S1	Note 3

Note 1. Some Models use a .001MFD @ 200V in this application.
Note 2. Some Models use a 8MFD in this application.
Note 3. Not used in all Models.
♦ Items C33A, C33B and R15 are combined in one unit.

CHASSIS—TOP VIEW



PROPERTY OF
L. F. DUNKENSHIP
DENVER, COLORADO

PARTS LIST AND DESCRIPTIONS (Continued)

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	David Bogen PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1A	1 Meg	½	V320A	Q13-137	AG-63-Z	B-70-S	U-53	Volume
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R1A
C	Switch		Not Req.	76-1	SWB	Not Req.	US-26	Attach to R1A
R2A	2 Meg	½	V319A	Q11-139	AG-83-S	B-75	U-56	Bass
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R2A
R3A	2 Meg	½	V319A	Q11-139	AG-83-S	B-75	U-56	Treble
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R3A

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	David Bogen PART No.	IRC PART No.	
R4	68Ω	½		BTS-68	
R5	3.3Meg	½		BTS-3.3Meg	
R6	1000Ω	½		BTS-1000	
R7	10KΩ	½		BTS-10K	
R8	220Ω	½		BTS-220	
R9	560Ω	½		BTS-560	
R10	220Ω	½		BTS-220	
R11	270KΩ	½		BTS-270K	
R12	1 Meg	½		BTS-1 Meg	
R13	68Ω	½		BTS-68	
R14	1000Ω	½		BTS-1000	
R15	47KΩ	½	♦	BTS-47K	
R16	470KΩ	½		BTS-470K	
R17	6800Ω	½		BTS-6800	
R18	1000Ω	½		BTS-1000	
R19	47KΩ	½		BTS-47K	
R20	15KΩ	½		BTS-15K	
R21	33KΩ	½		BTS-33K	
R22	47KΩ	½		BTS-47K	
R23	100KΩ	½		BTS-100K	
R24	100KΩ	½		BTS-100K	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	David Bogen PART No.	IRC PART No.	
R25	68KΩ	½		BTS-68K	
R26	1 Meg	½		BTS-1 Meg	
R27	47KΩ	½		BTS-47K	
R28	1500Ω	½		BTS-1500	
R29	68KΩ	½		BTS-68K	
R30	1 Meg	½		BTS-1 Meg	
R31	68KΩ	½		BTS-68K	
R32	68KΩ	½		BTS-68K	
R33	10KΩ	½		BTS-10K	
R34	470KΩ	½		BTS-470K	
R35	4700Ω	½		BTS-4700	
R36	100KΩ	½		BTS-100K	
R37	270KΩ	½		BTS-270K	
R38	27KΩ	½		BTS-27K	
R39	1000Ω	½		BTS-1000	
R40	10KΩ	½		BTS-10K	
R41	220KΩ	½		BTS-220K	Note 1
R42	1000Ω	2		BTB-1000	
R43	680Ω	2		BTB-680	Note 2
R44	68Ω	½		BTS-68	
R45	47Ω	½		BTS-47	

Note 1. Not used in all models.
Note 2. Some models may use a 560Ω resistor in this application.
♦ Items R15, C33A, C33B, are combined in one unit.

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA					
	PRI.	SEC. 1	SEC. 2	SEC. 3	David Bogen PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.
T1	117VAC @.32A	300VCT .034A	6.3VAC @3.7A		T-375-1					

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	David Bogen PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	FM Ant. Coil	.8Ω		4501	19-3001	TV-189	4602	1 Microhenry (IRC part #CLA)
L2	FM RF Choke	.8Ω		4501	19-3001	TV-189	4602	1 Microhenry (IRC part #CLA)
L3	FM RF Coil	0Ω		U402				
L4	Parasitic Suppressor	0Ω		4505				Wound on 1KΩ resistor
L5	FM Osc. Coil	0Ω (Tapped)		U418				
L6	AM Ant. Coil	.1Ω	1.8Ω	U306	14-1071	BC-380	70-A	
L7	Fil. Choke	.8Ω		U501	19-3001	TV-189	4602	1 Microhenry (IRC part #CLA)
L8	Fil. Choke	.8Ω		U501	19-3001	TV-189	4602	1 Microhenry (IRC part #CLA)

CHASSIS—BOTTOM VIEW

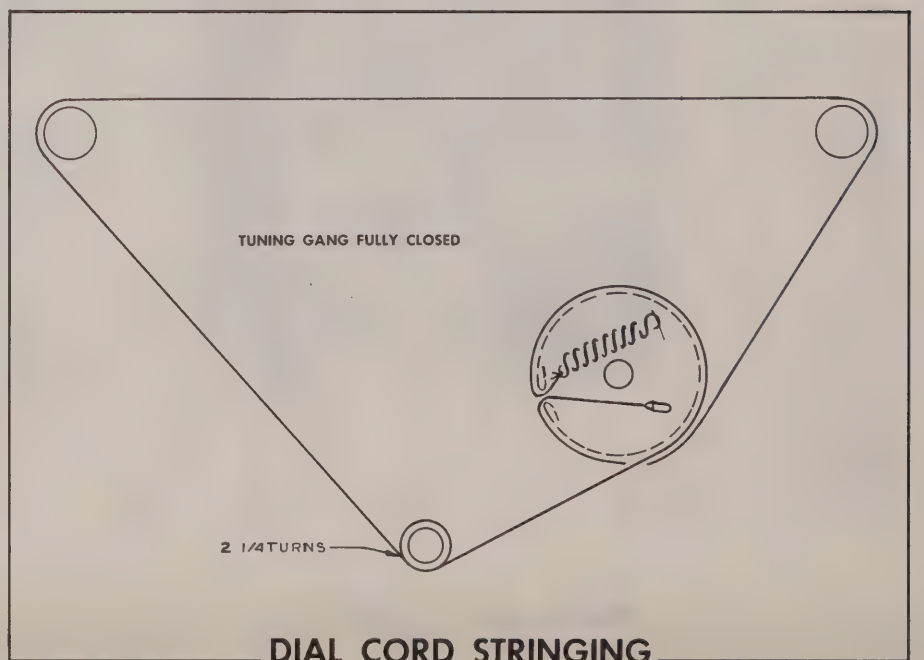
COILS (cont)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	David Bogen PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L9	RF Choke	.8Ω		U501	19-3001	TV-189	4602	1 Microhenry (IRC part #CLA)
L10	AM Osc. Coil	2.2Ω		U303	14-1060		71-Osc.	Tapped @ .3Ω
L11	RF Choke	.8Ω		U501	19-3001	TV-189	4602	1 Microhenry (IRC part #CLA)
L12	1st. FM IF	.6Ω	.6Ω	H294	16-3487	FM-254	1463	
L13	1st. AM IF	15Ω	15Ω	H386	16-6758	BC-352	12-C1	
L14	2nd. FM IF	.8Ω	.8Ω	H355	16-3487	FM-254	1463	
L15	2nd. AM IF	15Ω	15Ω	H386	16-6758	BC-353	12-C2	
L16	3rd. FM IF	.6Ω		H371	16-3487 *	FM-254 *	1463 *	
L17	FM Discriminator	.7Ω	1.1Ω CT	H295	17-3484 †	FM-253	1464	

* Detune unused winding.
† Cut out chassis hole and drill mounting holes.

MISCELLANEOUS

ITEM No.	PART NAME	David Bogen PART No.	NOTES
M1	Dial Light		(2) used #47 Bayonet
M2	Tuning Cap.	C627	4 Section -AM (17-495MMF) (28-200MMF)
M3	Switch	S387	Input Selector
M4	Switch	S381	Phono pickup (DPDT slide)



DIAL CORD STRINGING

GENERAL ELECTRIC MODEL A1-300

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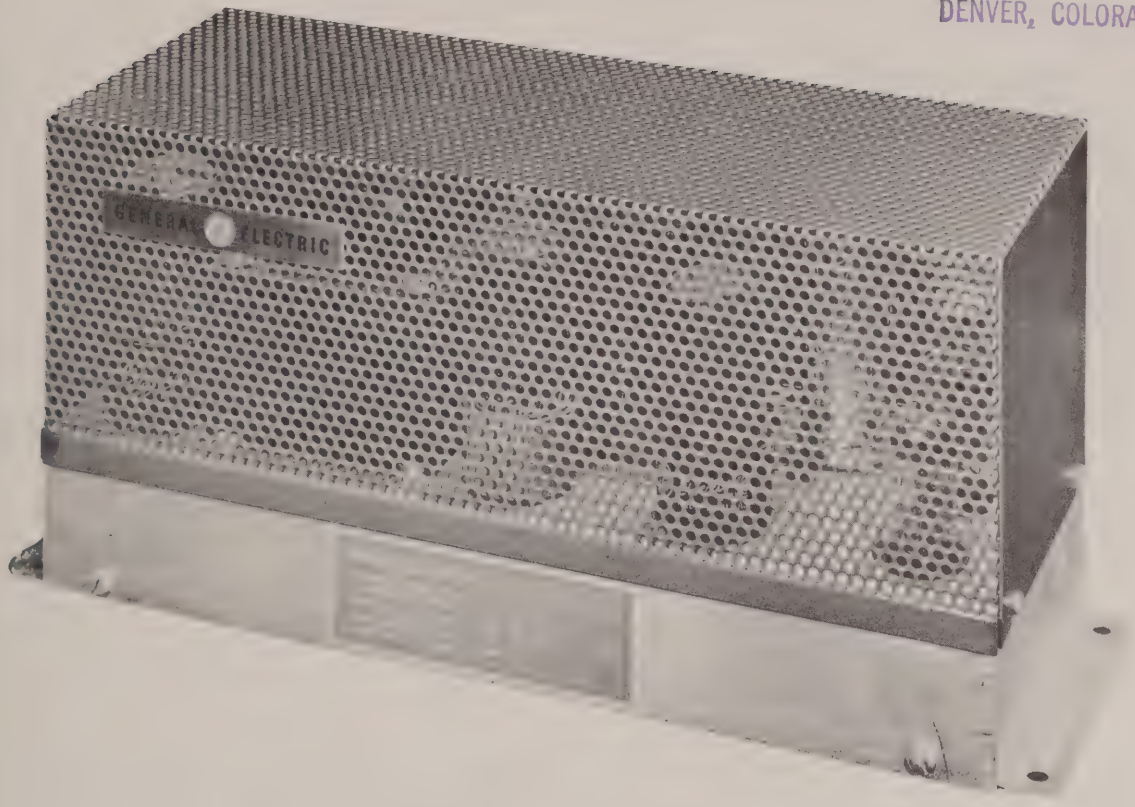
3924 MEADE ST.
DENVER, COLORADO

GENERAL ELECTRIC
MODEL A1-300



GENERAL ELECTRIC
MODEL A1-300

TRADE NAME	General Electric Model A1-300
MANUFACTURER	General Electric, Electronics Dept., Electronics Park, Syracuse, N.Y.
TYPE SET	AC Operated 10 Watt Audio Amplifier
TUBES (Five)	Types 12AX7 AF Amp., 6C4 Phase Inv., (2) 6V6GT Audio Output, 5Y3GT Rectifier
POWER SUPPLY	105-120 Volts - 60 Cycles AC RATING .6 Amp. @ 117 Volts AC

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA		RETMA BASE TYPE	NOTES
		General Electric PART No.	STANDARD REPLACEMENT		
V1	AF Amplifier	12AX7	12AX7	9A	
V2	Phase Inverter	6C4	6C4	6BG	
V3	Audio Output	6V6GT	6V6GT	7S	
V4	Audio Output	6V6GT	6V6GT	7S	
V5	Rectifier	5Y3GT	5Y3GT	5T	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	General Electric PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	▬30	450	RCE-070	AFH4-81		D056		FP444.9	TVL-4742	
B	■30	450								
C	▲15	450								
D	30	50								
C2A	■20	350	RCE-041	AFH2-51		B040		FP234	TVL-2755	
B	▲20	350								
C3	.047	400	RCN-036	P488-047	DF-503	CUB4S47		PT4147	4TM-S47	
C4	.047	400	RCN-036	P488-047	DF-503	CUB4S47		PT4147	4TM-S47	
C5	100	500	UCG-028							
C6	.047	400	RCN-036	P488-047	DF-503	CUB4S47		PT4147	4TM-S47	
C7	.047	400	RCN-036	P488-047	DF-503	CUB4S47		PT4147	4TM-S47	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	General Electric PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1	100Ω	1					C100P	Hum adjust

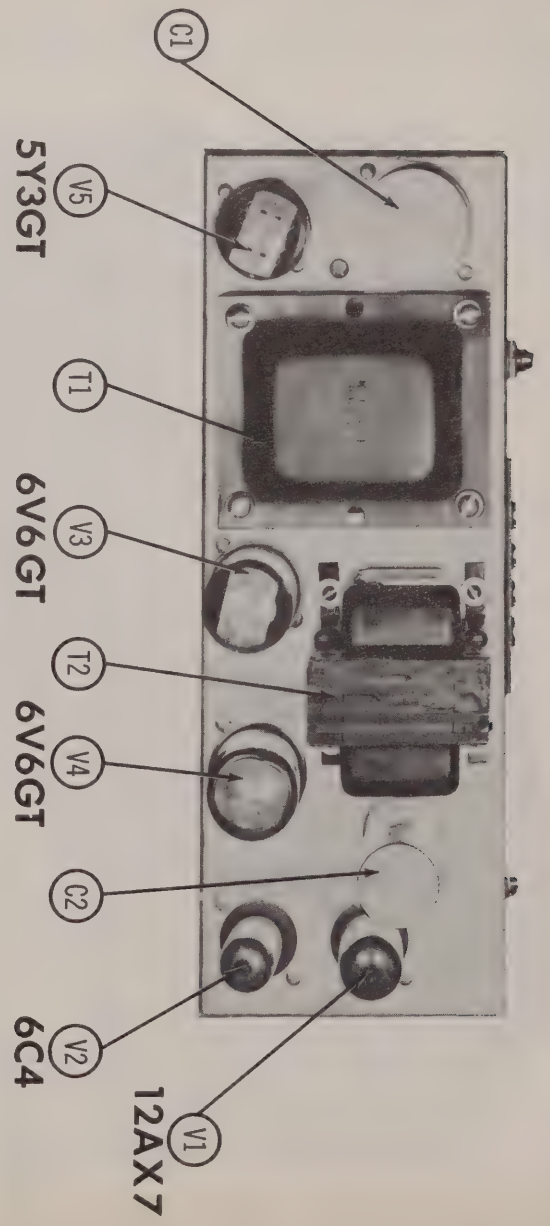
RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	General Electric PART No.	IRC PART No.	
R2	560KΩ	½		BTS-560K	Note 1
R3	100KΩ	½	URD-1097	BTS-100K	
R4	2700Ω	½		BTS-2700	Note 2
R5	100KΩ	½	URD-1097	BTS-100K	
R6	220KΩ	½	URD-105	BTS-220K	
R7	470KΩ	½	URD-113	BTS-470K	
R8	3000Ω	½	URD-1060	BTS-3000	
R9	200KΩ	½	URD-1104	BTS-200K	
R10	47KΩ	½	URD-089	BTS-47K	
R11	470KΩ	½	URD-113	BTS-470K	
R12	2000Ω	½	URD-1056	BTS-2000	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	General Electric PART No.	IRC PART No.	
R13	24KΩ	½	URD-1082	BTS-24K	
R14	22KΩ	½	URD-081	BTS-22K	
R15	24KΩ	½	URD-1082	BTS-24K	
R16	1000Ω	½	URD-049	BTS-1000	
R17	470KΩ	½	URD-113	BTS-470K	
R18	1000Ω	½	URD-049	BTS-1000	
R19	470KΩ	½	URD-113	BTS-470K	
R20	265Ω	5	RRW-107		
R21	6800Ω	½	URD-069	BTS-6800	
R22	10KΩ	1	URE-073	BTA-10K	
R23	1000Ω	2	URF-049	BTB-1000	

Note 1. Some models may use a 750KΩ resistor in this application.
Note 2. Some models may use a 2200Ω resistor in this application.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

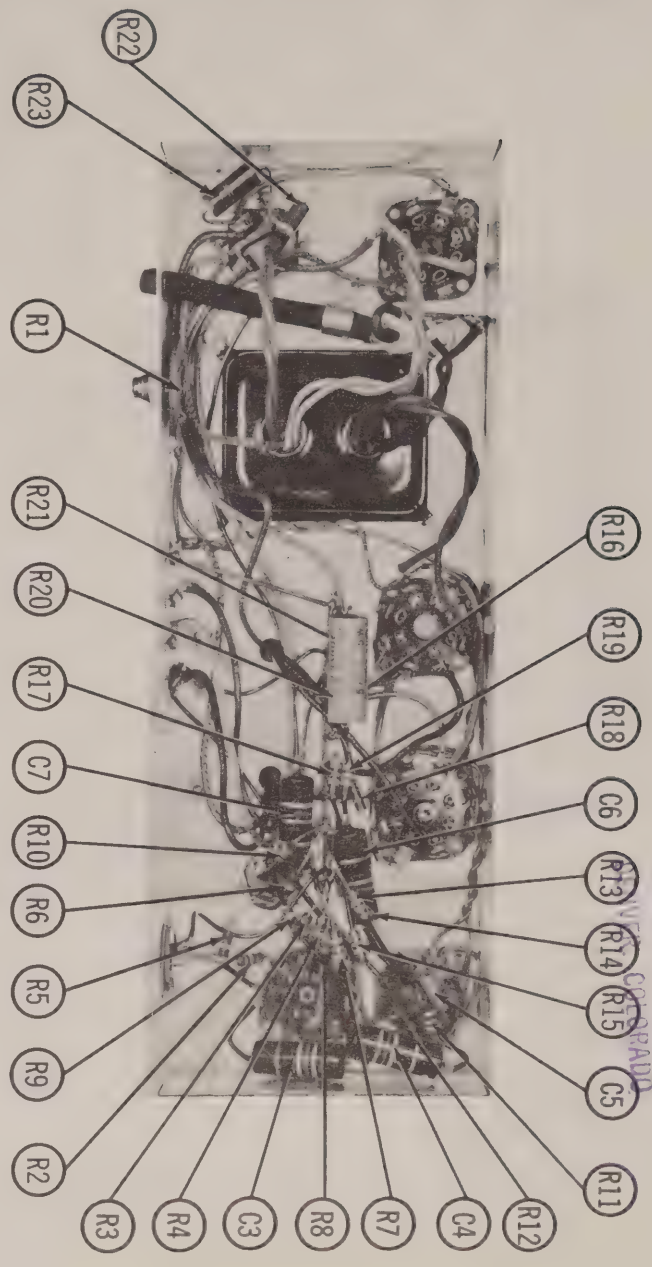
TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA					
	PRI.	SEC. 1	SEC. 2	SEC. 3	General Electric PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.
T1	117VAC @ .60A	650VCT .085ADC	5VAC @ 2A	6.3VAC @ 1.33A	RTP-317	PM-8409	P-2952	R-11B	P9311	

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	General Electric PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.	
T2	10KΩCT	16Ω tap @ 8Ω @ 4Ω	RTO-143			S-21A ①			① Drill new mounting holes.

CHASSIS—BOTTOM VIEW



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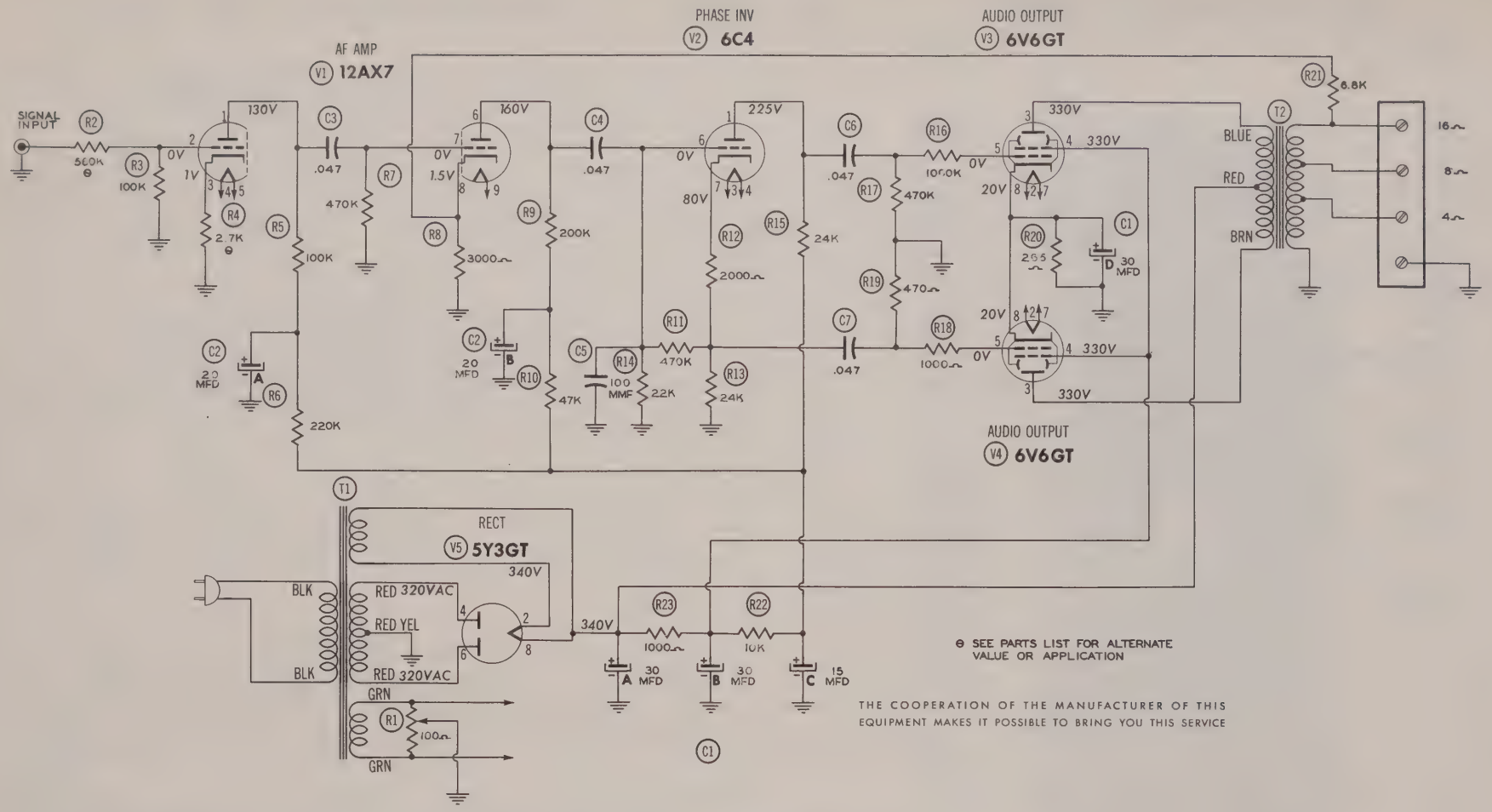

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	12AX7	†330KΩ	100KΩ	2.7KΩ	25Ω	25Ω	†260KΩ	470KΩ	2.1KΩ	25Ω
V 2	6C4	†35KΩ	22KΩ	25Ω	25Ω	†35KΩ	500KΩ	26KΩ		
V 3	6V6GT	INF	25Ω	†225Ω	†1KΩ	470KΩ	INF	25Ω	265Ω	
V 4	6V6GT	INF	25Ω	†295Ω	†1KΩ	470KΩ	INF	25Ω	265Ω	
V 5	5Y3GT	INF	100KΩ	INF	67Ω	INF	63Ω	INF	100KΩ	

† MEASURED FROM PIN 8 OF V5

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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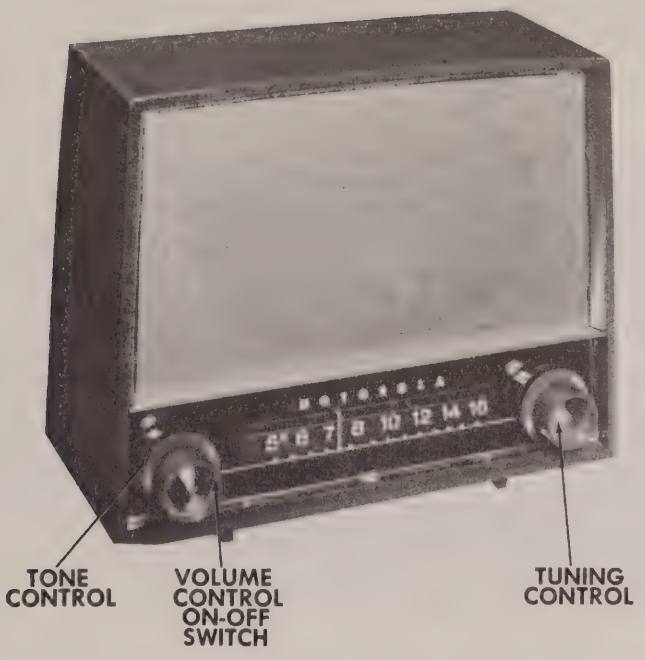
MOTOROLA MODELS
63X1, 63X1A, 63X2, 63X3 (Ch. HS-335)



PROPERTY OF
DENVER, COLORADO

MOTOROLA MODELS
63X1, 63X1A, 63X2, 63X3 (Ch. HS-335)

TRADE NAME	Motorola Models 63X1, 63X1A, 63X2, 63X3 (Ch. HS-335)
MANUFACTURER	Motorola, Inc., 4545 Augusta Blvd., Chicago, Ill.
TYPE SET	AC-DC Operated AM Superheterodyne Receiver
TUBES (Six)	Types 12BA6 RF Amp., 12BE6 Conv., 12BA6 IF Amp., 12AT6 Det.-AVC-AF Amp., 35C5 Audio Output, 35W4 Rectifier
POWER SUPPLY	110-120 Volts AC-DC RATING .24 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	535-1620KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
To set pointer, turn tuning capacitor fully closed and set pointer to last reference mark at low frequency end of dial.
Loop should be maintained in same relative position to chassis as when receiver is in cabinet.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 7 (grid) of 12BE6 (V2). Low side to B-.	455KC (400∿mod)	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.	"	High side to antenna stator lug (green lead) on tuning gang. Low side to B-.	1620KC	"	"	A5	"
3.	"	"	1400KC	Tune to 1400KC signal	"	A6	"
4.	"	Loop	"	"	"	A7	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output. If receiver is off calibration or mistracks badly at low frequencies continue alignment with steps 5, 6 and 7.
5.		"	600KC	Tune to 600KC signal	"	A8	Fashion loop of several turns of wire and radiate signal into loop of receiver.
6.		"	1620KC	Tuning gang fully open	"	A5	"
7.		"	1400KC	Tune to 1400KC signal	"	A6, A7	"

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA: MOTOROLA PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RETMA BASE TYPE	NOTES
V1	RF Amplifier	12BA6	12BA6	7BK	
V2	Converter	12BE6	12BE6	7CH	
V3	IF Amplifier	12BA6	12BA6	7BK	
V4	Det-AVC-AF Amp.	12AT6	12AT6	7BT	
V5	Audio Output	35C5	35C5	7CV	
V6	Rectifier	35W4	35W4	5BQ	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: MOTOROLA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	40	150	23B484234	PRS150/40-20-20		BBRT42215		TN129	TVA-3448	Red
B	20	150								Blue
C	20	150								Orange
C2	.05	400	8R9821	P488-05	DF-503	CUB4S5		PT415	4TM-S5	
C3	.05	200	8R9821	P288-05	DF-503	CUB2S5		PT415	2TM-S5	
C4	100		21R410036	SI100N750	TCN-100	N042	N750-811-101	NT-531	5TCU-T1	
C5A	220				D6-221	G051	811-221	UC-5322		
B	2000		21B482847	PA-100	DD-202	K072	801-002	DC-522	34C3	
C	220				D6-221	G051	811-221	UC-5322		
D	5000				DD-502	K080	811-005	DC-525		
C6	.005	600	8R9813	P688-005	D6-502	CUB6D5	GP2-333-502	PT625	6TM-D5	
C7	10000		21R482726	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C8	.02	400	8R9802	P488-02	DF-203	CUB4S2	817-02	PT412	4TM-S2	
C9	.047	400	8K490232	489ZX-05		CUB4S47		PT4147	4TM-S47	
C10	.15	200	8K72686	P288-15		CUB2P15		PT4015	2TM-P15	

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: MOTOROLA PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1 Meg	½	18B630601				UF16L	Tone Panel
B	1 Meg	½					UR16-T25 †	Volume tapped at 200K-rear
C	Switch						US-26	Attach to R1B

† Universal replacement (Mallory exact duplicate Part No. UE1678S).

RESISTORS

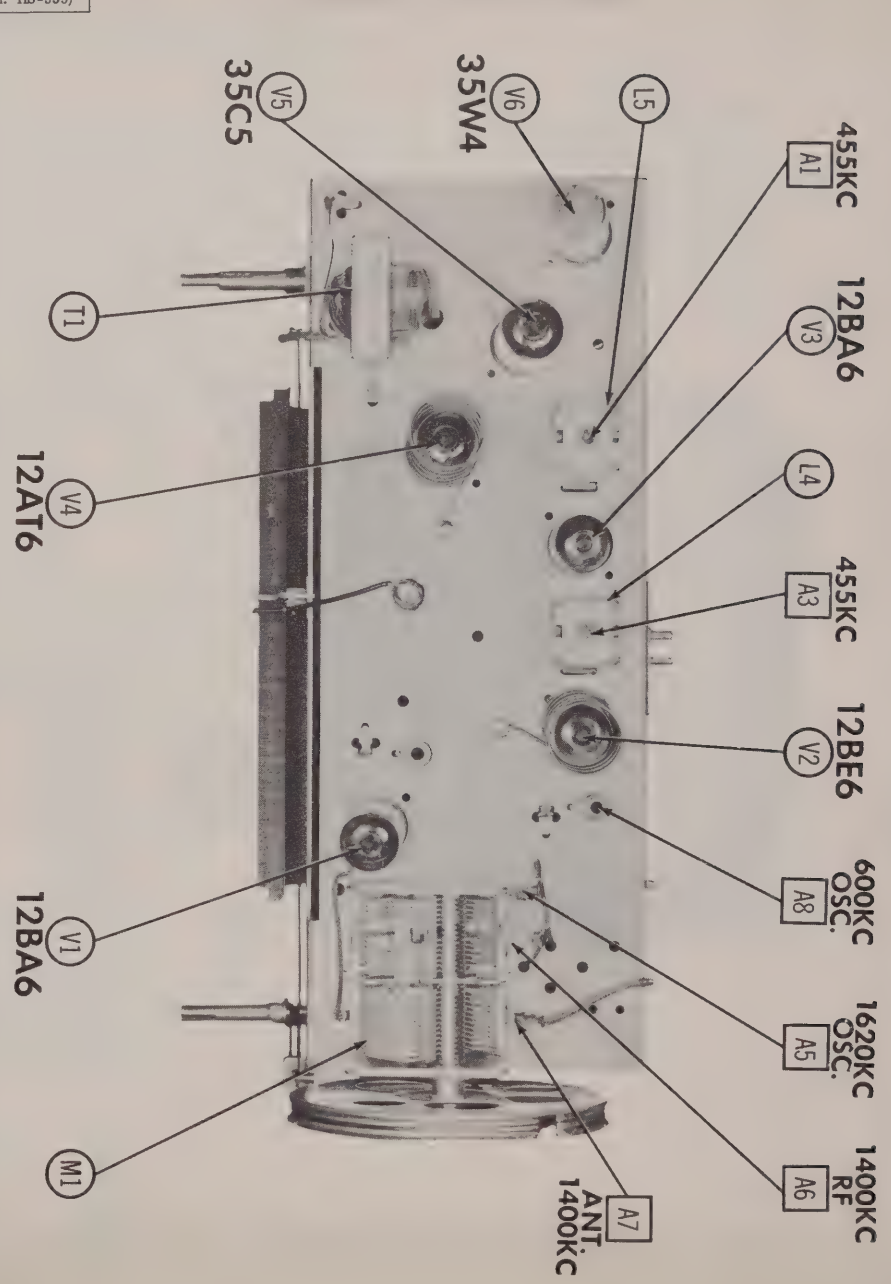
ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: MOTOROLA PART No.	REPLACEMENT DATA: IRC PART No.	NOTES
R2	100KΩ	½	6R6075	BTS-100K	
R3	100Ω	½	6R6326	BTS-100	
R4	560Ω	½	6R6291	BTS-560	
R5	22KΩ	½	6R6028	BTS-22K	
R6	100Ω	½	6R6326	BTS-100	
R7	3.3Meg	½	6R2718	BTS-3.3Meg	
R8	33KΩ	½	6R6012	BTS-33K	

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: MOTOROLA PART No.	REPLACEMENT DATA: IRC PART No.	NOTES
R9	10 Meg	½	6R2109	BTS-10 Meg	
R10	470KΩ	½	6R6032	BTS-470K	
R11	470KΩ	½	6R6032	BTS-470K	
R12	150Ω	½	6R3992	BTS-150	
R13	1000Ω	1	6R3953	BTA-1000	
R14	100Ω	1	6R488025	BTA-100	
R15	27Ω	½	6R5683	BTS-27	

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE: PRI.	IMPEDANCE: SEC.	REPLACEMENT DATA: MOTOROLA PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.	NOTES
T1	2.6KΩ	3.3Ω	25C630619	A-3332	A-3025	S-1X ①	Z1101	TS-24550①	① Drill one new mounting hole.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

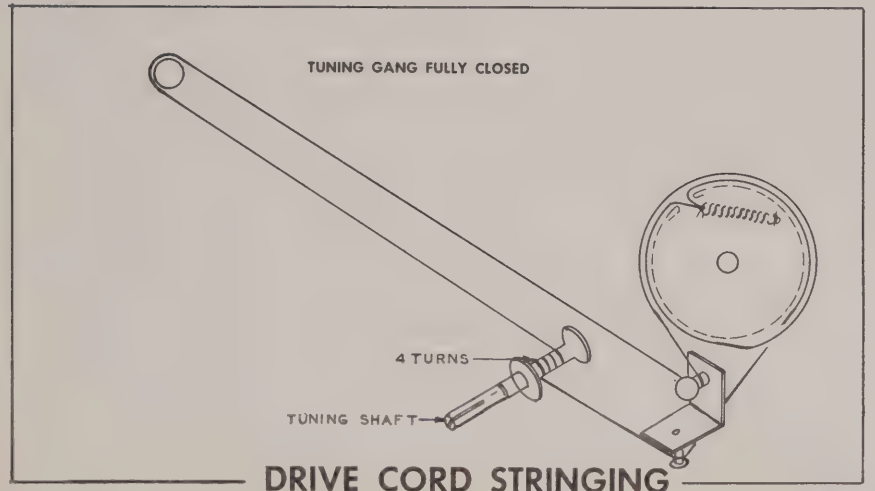
ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	MOTOROLA PART No.	JENSEN PART No.	QUAM PART No.	
SP1	6"X9"	PM	3.3Ω	50D630646 50D631489 ①			① Alternate 6" X 9" PM speaker.

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	MOTOROLA PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Loop Ant.	2Ω		1V630694				Includes cabinet back with power cord. Sec. tapped ② 5Ω
L2	RF Coil	3.4Ω	10Ω	24B630714	14-1076			
L3	Osc. Coil	.7Ω	10Ω	24B630610	14-1073		69-Osc.	
L4	Input IF	17Ω	17Ω	24C485553	16-6758	BC-352	12-C1	
L5	Output IF	17Ω	17Ω	24C485553	16-6758	BC-353	12-C2	

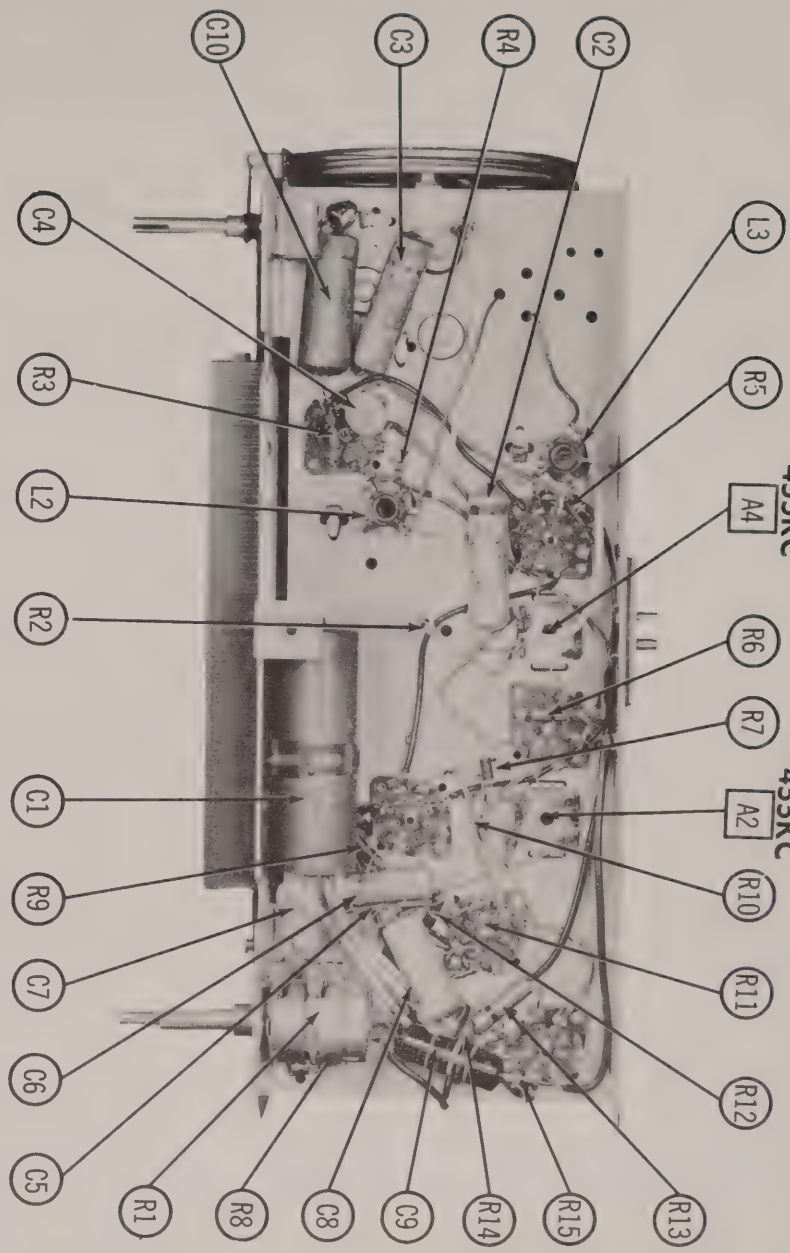
MISCELLANEOUS

ITEM No.	PART NAME	MOTOROLA PART No.	NOTES
M1	Tuning cap	19C630633	3 section (27-417MMF, 12-210MMF, 15-105MMF)
	Cabinet	16E630166	Ebony (63X1)
	Cabinet	16K631519	Walnut (63X1A)
	Cabinet	16K630167	Ivory (63X2)
	Cabinet	16K630168	Green (63X3)
	Knob	36B630634	Tuning
	Knob	36B630637	Volume black (63X1)
	Knob	36B630640	Tone
	Knob	36K631523	Tuning
	Knob	36K631522	Volume Walunt (63X1A)
	Knob	36K631524	Tone
	Knob	36K630635	Tuning
	Knob	36K630638	Volume Ivory (63X2)
	Knob	36K630641	Tone
	Knob	36K630636	Tuning
	Knob	36K630639	Volume Green (63X3)
	Knob	36K630642	Tone
	Dial scale	34D630667	



DRIVE CORD STRINGING

CHASSIS—BOTTOM VIEW



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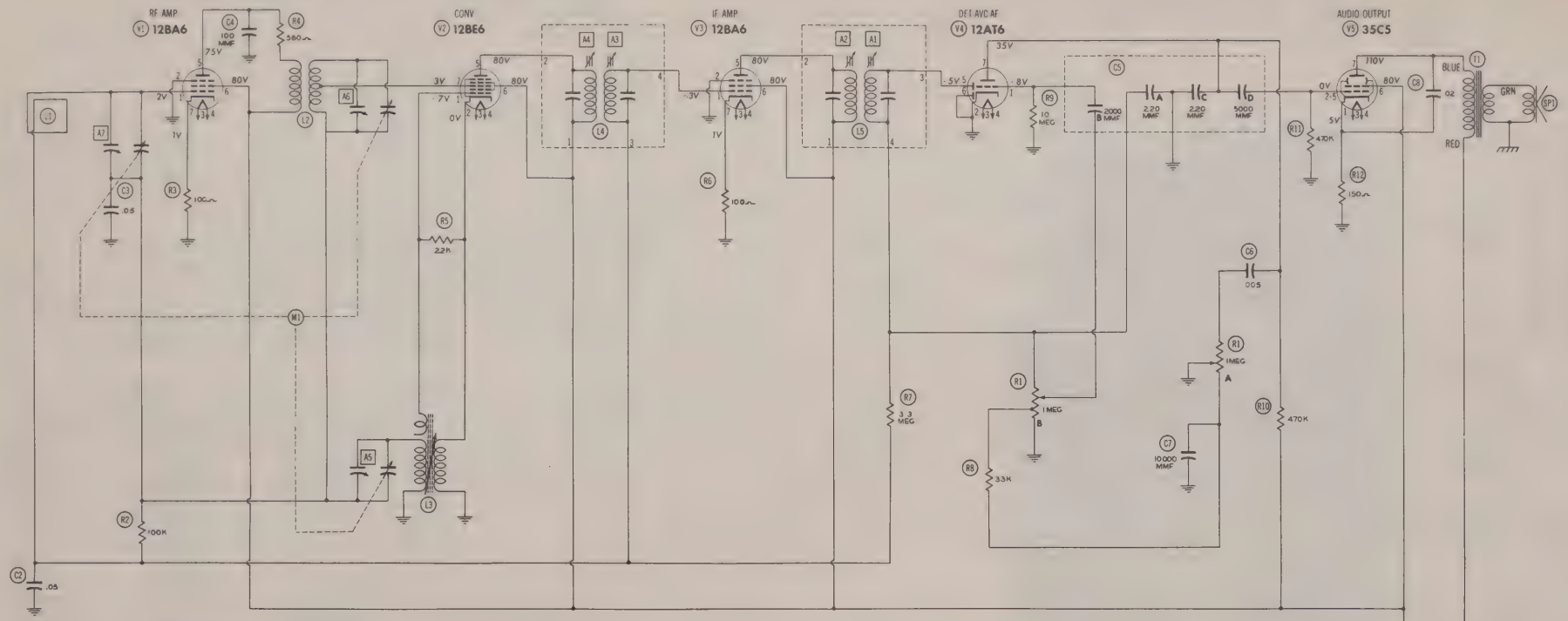
MOTOROLA
MODEL 63X1, (Ch. HS-335)



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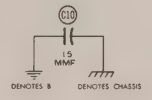

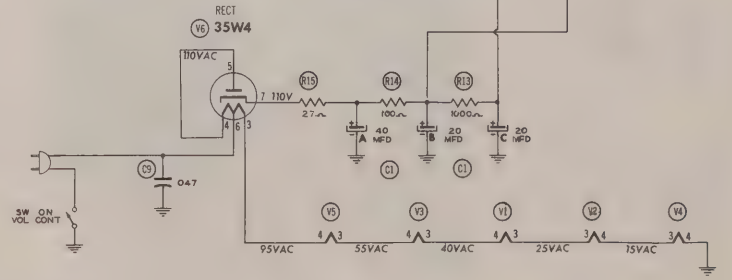

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	12BA6	4.3KΩ	0Ω	25Ω	38Ω	†1.7KΩ	†1.1KΩ	100Ω
V 2	12BE6	22KΩ	0Ω	25Ω	14Ω	†1.1KΩ	†1.1KΩ	4.4Meg
V 3	12BA6	4.3Meg	0Ω	38Ω	50Ω	†1.1KΩ	†1.1KΩ	100Ω
V 4	12AT6	10Meg	0Ω	0Ω	14Ω	1Meg	0Ω	†470KΩ
V 5	35C5	150Ω	470KΩ	50Ω	85Ω	470KΩ	†1.1KΩ	†340Ω
V 6	35W4	†127Ω	†1.1KΩ	85Ω	120Ω	120Ω	110Ω	100KΩ

† MEASURED FROM PIN 7 OF V6

1. DC voltage measurements taken with vacuum tube voltmeter.
2. AC voltages measured at 1000 ohms per volt.
3. Socket connections are shown as bottom views.
4. Measured values are from socket pin to common negative.
5. Line voltage maintained at 117 volts for voltage readings.
6. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
7. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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PHOTOFACT* Folder

RETMA MEMBER

PACKARD-BELL MODELS
2742, 2743, 2744, 2842, 2843, 2844
(Ch. 2740), 2941, 3041 (Ch. 2940, -1)

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PACKARD-BELL MODELS
2742, 2743, 2744, 2842, 2843, 2844
(Ch. 2740), 2941, 3041 (Ch. 2940, -1)

MODEL 2843

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DATE 5–54 SET 238 FOLDER 10

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*TRADE MARK

RETMA MEMBER

PACKARD-BELL MODELS 2742, 2743, 2744, 2842, 2843, 2844 (Ch. 2740), 2941, 3041 (Ch. 2940, -1)

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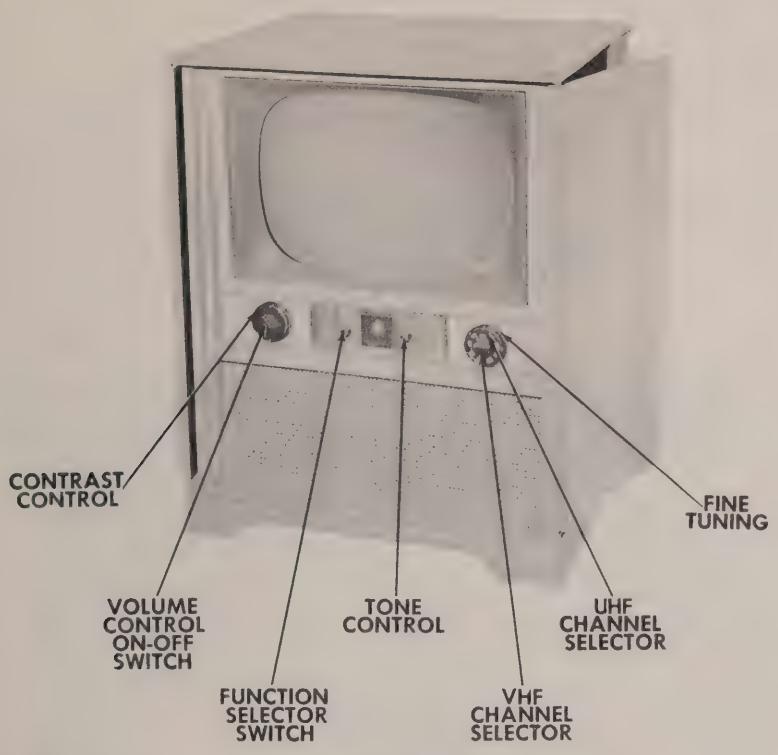

PACKARD-BELL MODEL 2843

TRADE NAME	Packard-Bell Models 2742, 2743, 2744, 2842, 2843, 2844 (Ch. 2740) 2941, 3041 (Ch. 2940, -1)
MANUFACTURER	Packard-Bell Co., -Service Division, 11th & Hope Streets, Los Angeles 15, California
TYPE SET	Television Receiver
TUBES	Twenty eight
POWER SUPPLY	110-120 Volts AC-60 cycle RATING 1.9 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)

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FOR SERVICE INFORMATION ON RECORD CHANGER FOR COMBINATION MODELS 2941, & 3041 SEE V-M MODELS 950 & 951 PHOTOFACT SET 216, FOLDER 11.

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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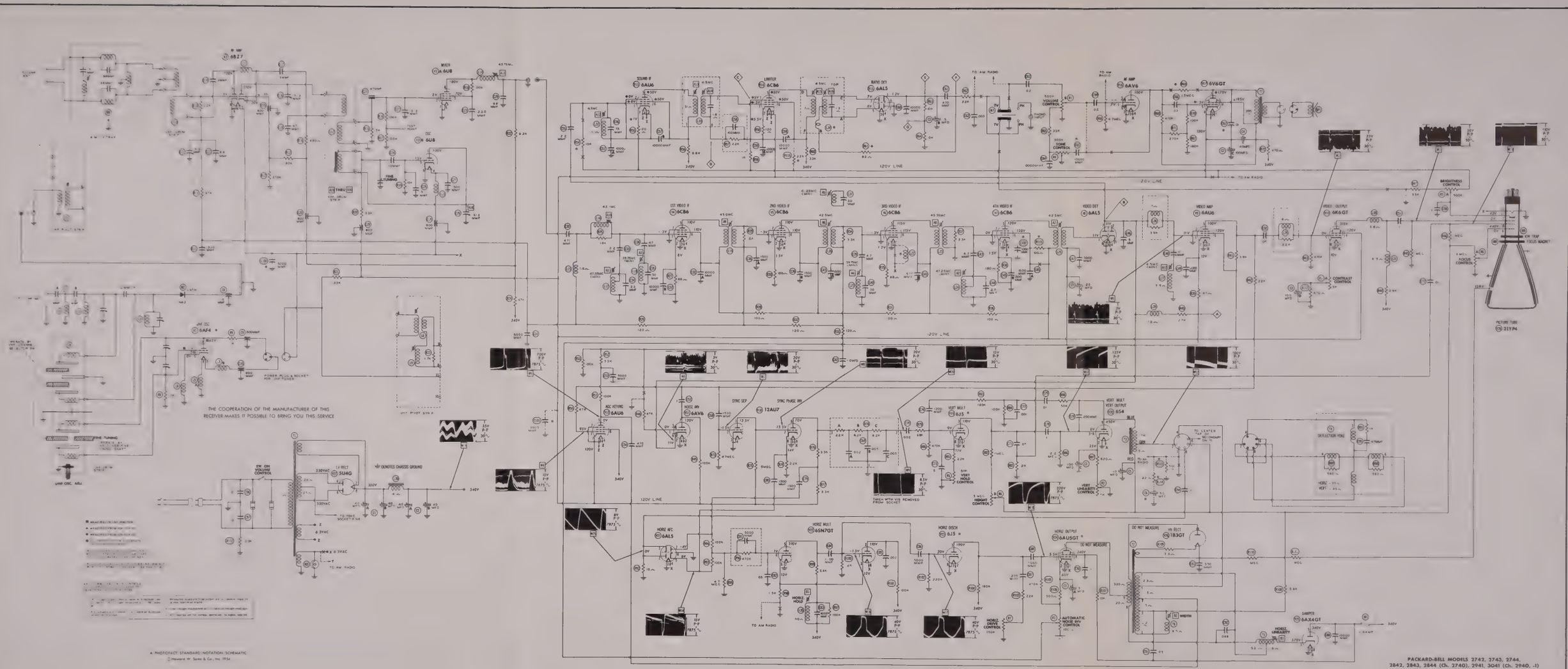
DATE 5-54 SET 238 FOLDER 10

PACKARD-BELL MODELS 2742, 2743, 2744, 2842, 2843, 2844 (Ch. 2740), 2941, 3041 (Ch. 2940, -1)


PACKARD-BELL MODELS 2742, 2743, 2744, 2842, 2843, 2844 (Ch. 2740), 2941, 3041 (Ch. 2940, -1)
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A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1954
PACKARD-BELL MODELS 2742, 2743, 2744, 2842, 2843, 2844 (Ch. 2740), 2941, 3041 (Ch. 2940, -1)

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CHASSIS TOP VIEW

PACKARD-BELL MODELS 2742, 2743, 2744, 2842, 2843, 2844 (Ch. 2740), 2941, 3041 (Ch. 2940, -1)

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CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION

TUBE PLACEMENT CHART

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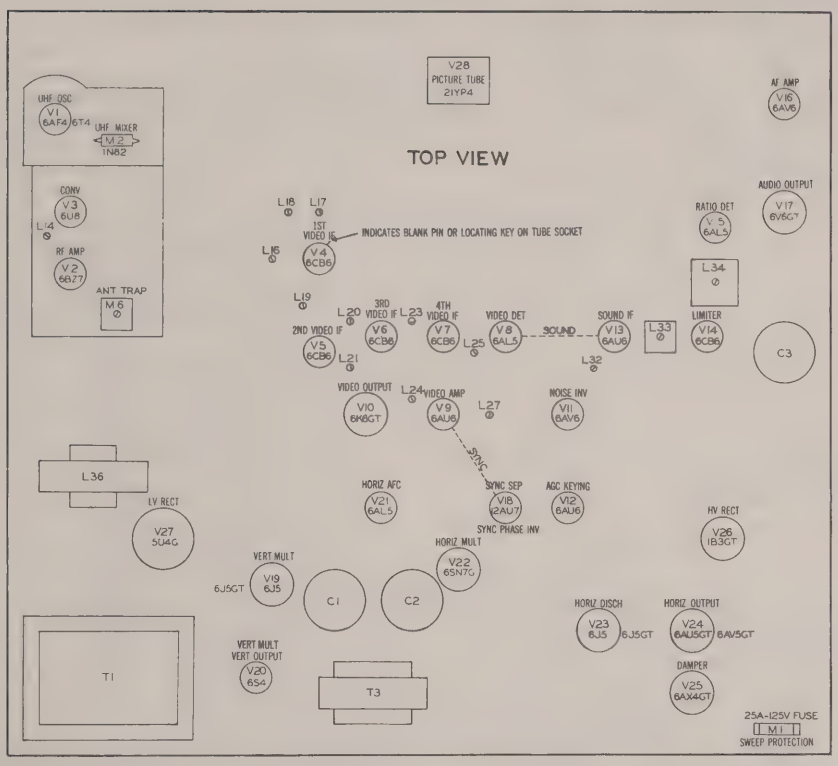

TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - **V27**

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - **V3, V4, V5, V6, V7, V8, V17, (V1 UHF only)**
No pic, no sound, has snow - **V2, V3, V4**
No pic, has sound, has raster - **V9, V10, V28**
Has pic, no sound - **V13, V14, V15, V16, V17**
Overloaded picture - **V12**

SYNC FAILURE
No vert. sync - **V18, V19**
No horiz. sync - **V18, V21, V22**
No vert. or horiz. sync - **V18**

SWEEP FAILURE
No raster, has sound - **V22, V23, V24, V25, V26, V28 Fuse (M1)**
No vertical deflection - **V19, V20**
Poor vert. linearity or foldover - **V19, V20**
Poor horiz. linearity or foldover - **V22, V23, V24, V25**
Narrow picture - **V22, V23, V24, V25, V26, V27**
Vert. off freq. - **V18, V19**
Horiz. off freq. - **V18, V21, V22**

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage lead should be securely taped and kept away from the chassis. Do not remove the horizontal oscillator tube (V22) to disable the high voltage.
Allow a 10 minute warm up period for receiver and test equipment.

VIDEO IF ALIGNMENT

Remove 6AV6 (V11) from its socket.
Connect the negative lead of a 3 volt battery to the ungrounded side of C42. Connect the positive lead to chassis.
In step 7 under "Signal generator coupling" the converter tube is a 6J6 in models 2742, 2743, 2744 and 2741.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	.001MFD	High side thru .001MFD to center pin of IF plug on top of tuner (Remove plug from socket). Low side to chassis. (keep leads short as possible)	47.25MC (Unmod)	Any	DC probe to point (B). Common to point (C).	A1, A2	Use maximum output from signal generator. Adjust for MINIMUM deflection.
2.	"	"	39.75MC	"	"	A3, A4	"
3.	"	"	41.25MC	"	"	A5	Attenuate signal generator to maintain 2.5 to 3 volts, at VTVM. Adjust for MINIMUM deflection.
4.	"	"	42.5MC	"	"	A6, A7	Attenuate signal generator to maintain 2.5 volts to 3 volts at VTVM. Adjust for maximum deflection.
5.	"	"	45.35MC	"	"	A8	"
6.	"	"	45.0MC	"	"	A9	Adjust for maximum deflection. Repeat steps 1 thru 6. Disconnect signal generator and replace IF plug in tuner.
7.	Direct	High side to an ungrounded tube shield floating over converter tube (V3). Low side to chassis.	42.1MC	Any non-interfering channel	"	A10	Attenuate signal generator to maintain 2.5 to 3 volts at VTVM. Adjust for maximum deflection.
8.	"	"	45.75MC	"	"	A11	Adjust for maximum deflection. Remove VTVM and 3 volt bias battery.

OVERALL VIDEO IF RESPONSE CHECK

Connect the negative lead of a 5MFD, 50 volt capacitor to the ungrounded side of C53. Connect the positive lead to chassis.
Couple a second signal generator to ungrounded tube shield of converter tube (V3) to provide markers on response curve.
Connect DC probe of VTVM to the ungrounded side of C42. Common to chassis. Adjust sweep generator output for approximately 4 volts on VTVM.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
9.	Two 120Ω carbon resistors	Across antenna terminals with 120Ω in each lead	63MC (10MC Swp)	39.75MC 41.25MC 42.25MC 45.0MC 45.75MC 47.25MC	3	Vert. amp thru 22KΩ to point (B). Low side to chassis.		Check for response curve similar to Fig. 1. The 47.25, 41.25, and 39.75MC markers should be at MINIMUM response. The 45.0 MC marker should not exceed 97% or smear may occur. If necessary, SLIGHTLY retouch A5 thru A11 to obtain desired response.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
10.	.001MFD	High side to point (B). Low side to chassis.	4.5MC (Unmod)	Any non-interfering channel	DC probe to point (D). Common to point (C).	A12, A13, A14	Adjust for maximum deflection.
11.	"	"	"	"	DC probe to point (E). Common to chassis.	A15	"
12.	"	"	"	"	DC probe to point (F). Common to point (G).	A16	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60~ modulation and 450KC sweep. Use 120~ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
10.	.001MFD	High side to point (B). Low side to chassis.	4.5MC (450KC Swp)	4.5MC	Any non-interfering channel	Vert. amp. to point (E). Low side to chassis.	A12, A13, A14, A15	Disconnect stabilizing capacitor C3B. Adjust for curve of maximum amplitude and symmetry similar to Fig. 2.
11.	"	"	"	"	"	Vert. amp to point (E). Low side to chassis.	A16	Reconnect stabilizing capacitor C3B. Adjust so that 4.5MC occurs at center of crossover lines as in Fig. 3. SLIGHTLY retouch A15 for maximum amplitude and straightness of crossover lines. Continue alignment with Step 13.

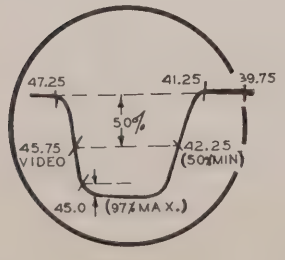

FIG. 1

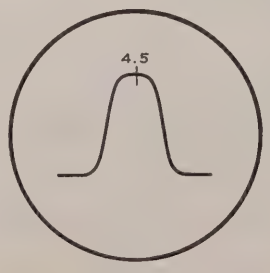

FIG. 2

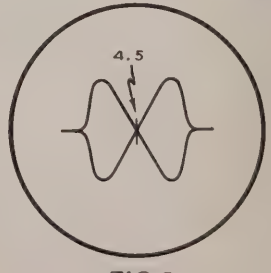

FIG. 3

ALIGNMENT INSTRUCTIONS (cont)

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4.5MC TRAP ALIGNMENT

If a 4.5MC signal generator of crystal accuracy capable of at least one volt output is not available, tune in a TV station and adjust A17 for MINIMUM 4.5MC beat interference in the picture.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
13.	.001MFD	High side to point (B). Low side to chassis.	4.5MC (Unmod)	Any	DC probe thru detector (Fig.4) to pin 2 of picture tube. Low side to chassis.	A17	Remove 6AL5 (V8) from its socket. Set contrast control to maximum contrast position. Set generator for maximum output. Adjust A17 for MINIMUM deflection.

OSCILLATOR ALIGNMENT (VHF-UHF TUNER 10535C)

Replace 6AV6 (V11) in its socket and restore converter tube shield to its normal position.
Complete oscillator alignment may not be necessary. If the oscillator seems to be off frequency approximately the same amount for a majority of channels it may be possible to correct them in one step using A18. It should be noted that this is an all channel oscillator circuit adjustment and should not be used to correct any individual channel.
If adjustment of A18 will not bring all channels well within the range of the fine tuning control it will be necessary to adjust the channel strip adjustment for each channel that is off frequency.
The channel adjustment screws are reached thru a hole (hole extends thru UHF tuner) just above and SLIGHTLY to the left of the channel switch shaft.
The correct adjustment screw is accessible thru this hole as the channel switch is turned to each channel.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
14.	Two 120Ω carbon resistors	Across antenna terminals with 120Ω in each lead	213MC (10MC Swp)	211. 25MC 215. 75MC	13	Vert. amp. thru 10KΩ to point (B). Low side to chassis.	A19	Adjust to place sound marker as shown in Fig. 5. Video marker should be at 50%
			207MC (10MC Swp)	205. 25MC 209. 75MC	12		A20	
			201MC (10MC Swp)	199. 25MC 203. 75MC	11		A21	
			195MC (10MC Swp)	193. 25MC 197. 75MC	10		A22	
			189MC (10MC Swp)	187. 25MC 191. 75MC	9		A23	
			183MC (10MC Swp)	181. 25MC 185. 75MC	8		A24	
			177MC (10MC Swp)	175. 25MC 179. 75MC	7		A25	
			85MC (10MC Swp)	83. 25MC 87. 75MC	6		A26	
			79MC (10MC Swp)	77. 25MC 81. 75MC	5		A27	
			69MC (10MC Swp)	67. 25MC 71. 75MC	4		A28	
			63MC (10MC Swp)	61. 25MC 65. 75MC	3		A29	
			57MC (10MC Swp)	55. 25MC 59. 75MC	2		A30	

RF AND MIXER ALIGNMENT (VHF-UHF TUNER 10535C)

The RF and mixer and UHF portions of this receiver have been properly aligned at the factory and are very stable. Alignment of these portions should not be required in the field.

OSCILLATOR ALIGNMENT (VHF TUNER 10534A)

The oscillator alignment of VHF tuner 10534A is identical to the oscillator alignment for VHF/UHF tuner 10535C with the following exception: The VHF tuner has no all channel oscillator adjustment. See step 14 for the individual oscillator channel strip adjustments.

RF AND MIXER ALIGNMENT (VHF TUNER 1534A)

The RF and mixer portion of this receiver has been properly aligned at the factory and is very stable. Alignment of this portion should not be required in the field.

AM TUNER ALIGNMENT (MODELS 2941 and 3041)

Set the function switch to "radio" position.
Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
15.	.01MFD	High side to pin 7 (grid) of 6BE6 (V1). Low side to chassis.	455KC (400∿Mod)	AM	Tuning gang fully open	Across voice coil	A31, A32 A33, A34	Adjust for maximum deflection.
16.		Loop	1620KC	"	"	"	A35	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
17.		"	1500KC	"	Tune to 1500KC signal	"	A36	"
18.		"	600KC	"	Tune to 600KC signal	"		Adjust for maximum deflection by moving sleeve on loop stick (on some models a segment of the coil is moveable). It may be necessary to repeat steps 17 and 18 several times to obtain perfect tracking.

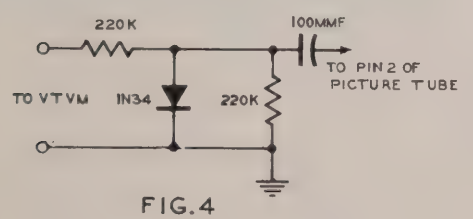


FIG. 4

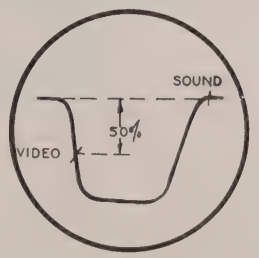
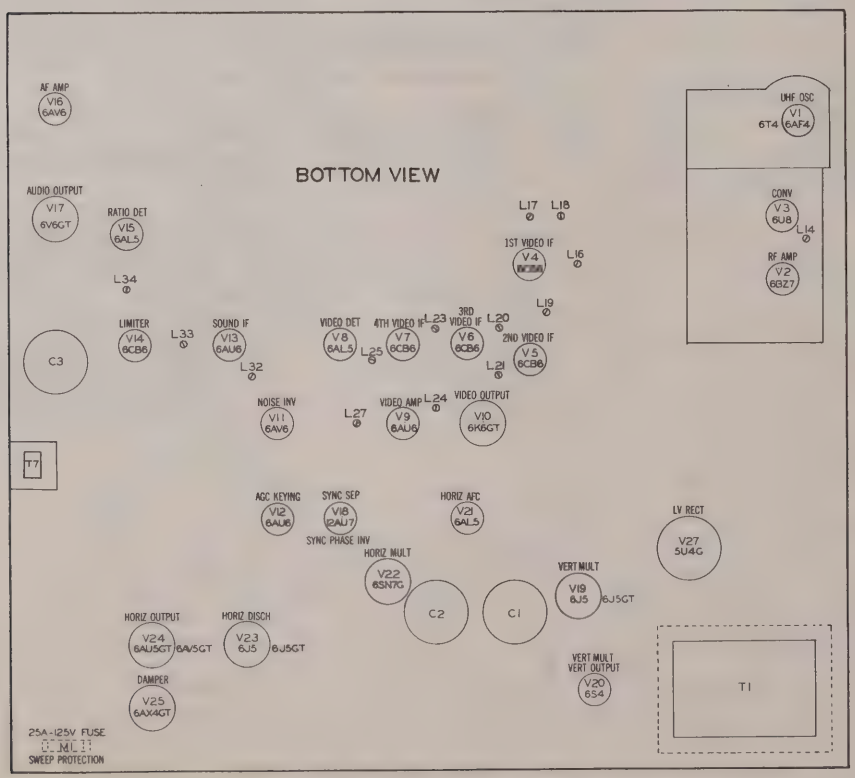


FIG. 5

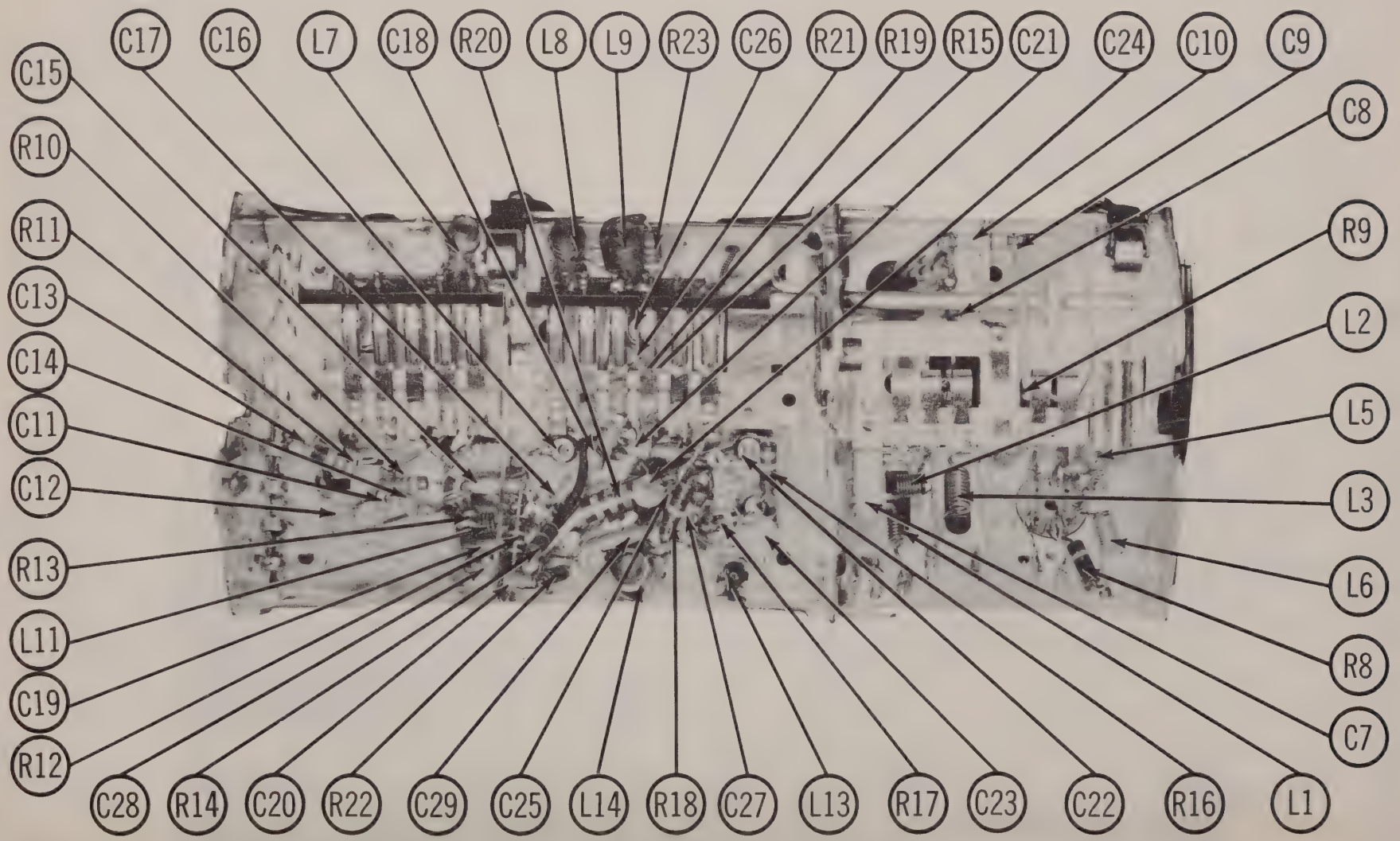
RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6AF4	■▲4.3KΩ	10KΩ	.1Ω	0Ω	0Ω	10KΩ	■▲4.3KΩ		
V 2	6BZ7	†5.4KΩ	135KΩ	INF	0Ω	.1Ω	INF	150KΩ	0Ω	0Ω
V 3	6U8	▲3.3KΩ	200KΩ	†113KΩ	.1Ω	0Ω	†13KΩ	0Ω	0Ω	10KΩ
V 4	6CB6	100KΩ	68Ω	0Ω	.1Ω	▲300Ω	▲300Ω	0Ω		
V 5	6CB6	100KΩ	100Ω	0Ω	.1Ω	▲200Ω	▲200Ω	0Ω		
V 6	6CB6	100KΩ	68Ω	0Ω	.1Ω	▲100Ω	▲100Ω	0Ω		
V 7	6CB6	.1Ω	180Ω	0Ω	.1Ω	▲.1Ω	▲0Ω	0Ω		
V 8	6AL5	100Ω	100KΩ	0Ω	.1Ω	INF	0Ω	2.8KΩ		
V 9	6AU6	2.8KΩ	0Ω	.1Ω	0Ω	▲3.9KΩ	▲0Ω	147Ω		
V 10	6K6GT	0Ω	0Ω	†4KΩ	▲0Ω	470KΩ	470KΩ	.1Ω	1.4KΩ	
V 11	6AV6	147KΩ	2.8KΩ	.1Ω	0Ω	INF	INF	▲100KΩ		
V 12	6AU6	▲75KΩ	▲0Ω	▲0Ω	▲.1Ω	200KΩ	†41Ω	▲0Ω		
V 13	6AU6	▲1Ω	▲0Ω	▲0Ω	▲.1Ω	†6.8KΩ	†6.8KΩ	▲120Ω		
V 14	6CB6	▲23KΩ	▲1.1KΩ	▲0Ω	▲.1Ω	†33KΩ	†33KΩ	▲1KΩ		
V 15	6AL5	20KΩ	0Ω	0Ω	.1Ω	INF	0Ω	INF		
V 16	6AV6	4.7Meg	0Ω	0Ω	.1Ω	INF	INF	†470KΩ		
V 17	6V6GT	0Ω	▲0Ω	†900Ω	†510Ω	250KΩ	150KΩ	▲.1Ω	250KΩ	
V 18	12AU7	▲1.5Meg	4.7Meg	0Ω	0Ω	0Ω	▲6.6KΩ	▲1.5Meg	2.2KΩ	.1Ω
V 19	6J5	0Ω	0Ω	◓2.8Meg	◓1.8Meg	470KΩ	◓160KΩ	.1Ω	70KΩ	
V 20	6S4	INF	2.2KΩ	2.2Meg	0Ω	.1Ω	2.2Meg	INF	INF	◓7.3KΩ
V 21	6AL5	10Ω	10Ω	0Ω	.1Ω	4.8Meg	0Ω	4.8Meg		
V 22	6SN7GT	12KΩ	†100KΩ	1.5KΩ	5.2Meg	†5.7KΩ	1.5KΩ	.1Ω	0Ω	
V 23	6J5	0Ω	.1Ω	†180KΩ	†41Ω	220KΩ	10Ω	0Ω	0Ω	
V 24	6AU5GT	470KΩ	0Ω	600Ω	INF	◓27Ω	INF	.1Ω	†10KΩ	
V 25	6AX4GT	INF	INF	2Meg	INF	† 45Ω	100KΩ	0Ω	.1Ω	
V 26	1B3GT		PINS	1 - 8	HAVE	INF	RESISTANCE			TOP CAP ◓547Ω
V 27	5U4G	INF	90KΩ	INF	24Ω	INF	25Ω	INF	90KΩ	
V 28	21YP4	0Ω	1Meg	PIN 6 400Ω	PIN 10 ◓1Meg	PIN 11 ▲120KΩ	PIN 12 .1Ω			

■ MEASURED IN UHF POSITION.
▲ MEASURED FROM PIN 8 OF V17.
† MEASURED FROM PIN 8 OF V27.
◓ MEASURED FROM PIN 3 OF V25.



TUBE PLACEMENT CHART



RF TUNER-BOTTOM VIEW

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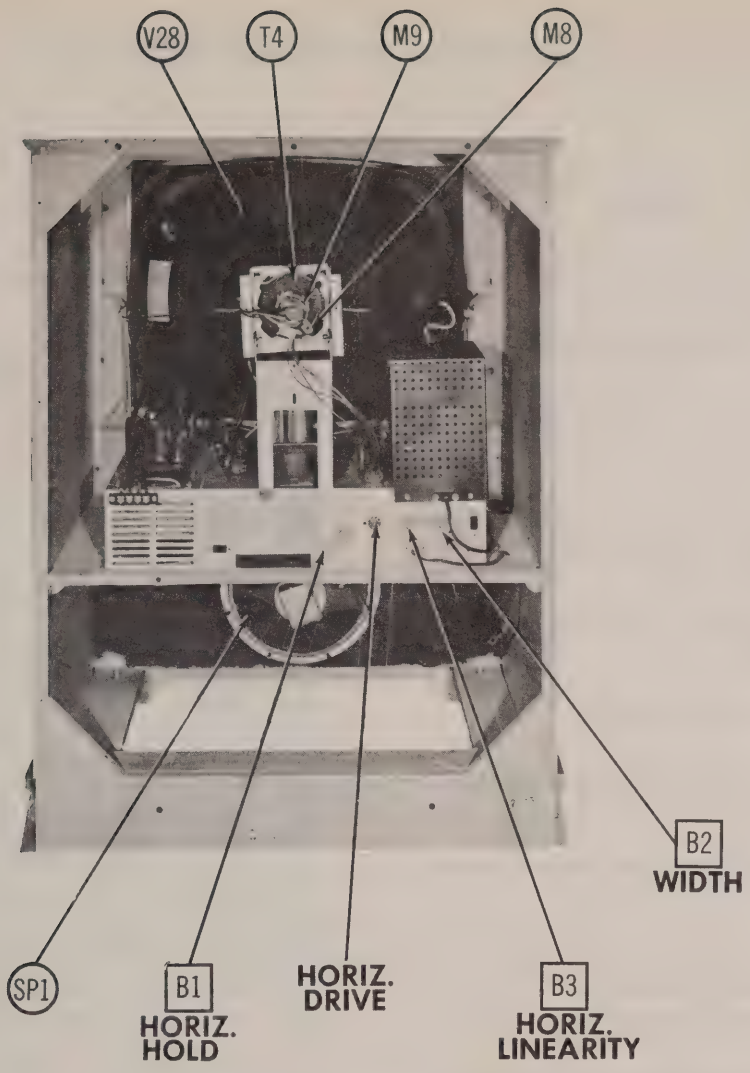


CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.

Adjust the horizontal oscillator slug, B1, (labeled "Horizontal Hold" on rear panel) until the picture synchronizes horizontally. The correct setting of B1 is approximately half way between the points where the picture tears.

Adjust the horizontal drive control in a clockwise direction as far as possible without the presence of vertical white lines or compression near the center of the picture.

Adjust the width slug (B2) for a picture slightly wider than neeessary to fill the picture mask horizontally.

Adjust the linearity slug (B3) for a picture that is symmetrical from left to right.

AUTOMATIC NOISE INVERTER

The ANI (automatic noise inverter) control should be adjusted at the location where the receiver is to be used. Tune in the weakest signal available and proceed as follows:

1. Turn ANI control fully counter clockwise.
2. Turn control clockwise until picture begins to distort.
3. Turn control counter clockwise slightly beyond the point where the distortion disappears.
4. Check picture stability on all channels. If control is not adjusted on weakest signal available, synchronization may be lost on some other channel.

TROUBLE SHOOTING AIDS

SWEEP

HORIZONTAL

LOSS OF SWEEP

Follow procedure outlined under "Loss of High Voltage".

INSUFFICIENT SWEEP

Check by substitution V23, V24, V25 and V27. Check adjustment of the horizontal drive control, B2 and B3. Check waveform W18.

If Satisfactory	If Unsatisfactory
Check C90, C91, C92, R107, T2, T4A, T5, T6 and other associated components.	Check C86, C87, C89, C84, R102, R104, R105 and other associated circuit components.

DRIVE LINES

Check adjustment of the horizontal drive control. Check by substitution V23, V24 and V25. Check C87, C89, R103, R104, T2, T4A, C91, C92, R91, C95 and other associated components for failure or change of value.

COMPRESSED LEFT SIDE

Check adjustments B2 and B3. Check by substitution V24 and V25. Check components associated with the horizontal output and damper stages. especially T2 and T4A.

FOLDS

Follow procedure outlined under "Drive Lines".

PIE CRUST EFFECT

Check by substitution V22, V24 and V25. Check C82 for open. Check T2, T4A, T5, T6, and other associated components.

XMAS TREE EFFECT

Substitute V22. Check C83, C84, L35 and other associated components.

VERTICAL

LOSS OF SWEEP

Check by substitution V19 and V20. Check waveform W11.

If Satisfactory	If Unsatisfactory
Check T3, T4B, R2, R87 and other associated circuit components.	Check C78, C71, R82, R86, and other associated circuit components.

INSUFFICIENT SWEEP

Check adjustment of height and vertical linearity controls. Proceed as outlined under "Loss of Sweep".

COMPRESSED AT BOTTOM

Check by substitution V19 and V20. Check T3, T4B, C1C and other associated circuit components.

COMPRESSED AT TOP

Check by substitution V19 and V20. Check C71, C75, C77, C78, R82, R86, and other associated components.

FOLDS

Check by substitution V19 and V20. Check associated components for failure or change of value.

SYNC

LOSS OF HORIZONTAL AND VERTICAL SYNC

Check by substitution V11 and V18, Check adjustment of the AN1 control. Check components associated with V11 and V18 especially C68, C52, R73 and R75.

LOSS OF VERICAL SYNC-HORIZONTAL SYNC SATISFACTORY

Check by substitution V18 and V19. Check waveform W9.

If Satisfactory	If Unsatisfactory
Check components associated with V19 especially C70 and C76.	Check vertical integrator and other components associated with V18.

LOSS OF HORIZONTAL SYNC-VERTICAL SYNC SATISFACTORY

Check by substitution V21 and V22. Check waveform W14.

If Satisfactory	If Unsatisfactory
Check R92, C94, C83, C84, C85, and other associated components.	Check C79, C80, R93, R94 and other associated components.

HORIZONTAL BENDING

Check by substitution V21, V22, V23 and V24. Check the horizontal AFC filter network for component failure.

VIDEO

LOSS OF VIDEO

Check by substitution V9 and V10. Check C50, C51, L26, L29, L30, L31, picture tube, contrast control and other associated components.

SOUND BARS (4.5MC BEAT)

Adjust tuner fine tuning for best picture and sound. Check adjustment A17. Check video IF alignment.

POOR CONTRAST

Check by substitution V8, V9 and V10. Check contrast control, picture tube and other associated components.

NEGATIVE PICTURE

Check by substitution V12, V10, V9, V8, V6, V5, V4, and V2. Check AGC network components. Check picture tube.

SMEAR

Check by substitution V8, V9 and V10. Check C50, C51, L26, L29, R41, R42, R43, R44, R45, contrast control, picture tube and other associated circuit components.

WIDE BLACK BAR ACROSS PICTURE

Check V2, V4, V5, V6, V7, V8, V9 and V10. for heater to cathode leakage. In case of UHF, check V1.

AUDIO

WEAK OR NO SOUND

Check by substitution V13, V14, V15, V16 and V17. Check stages V16 and V17 using audio signal generator. Apply audio signal across R66.

If Satisfactory	If Unsatisfactory
Check ratio detector and audio IF alignment and components.	Check components associated with V16 and V17 especially C66 and T7.

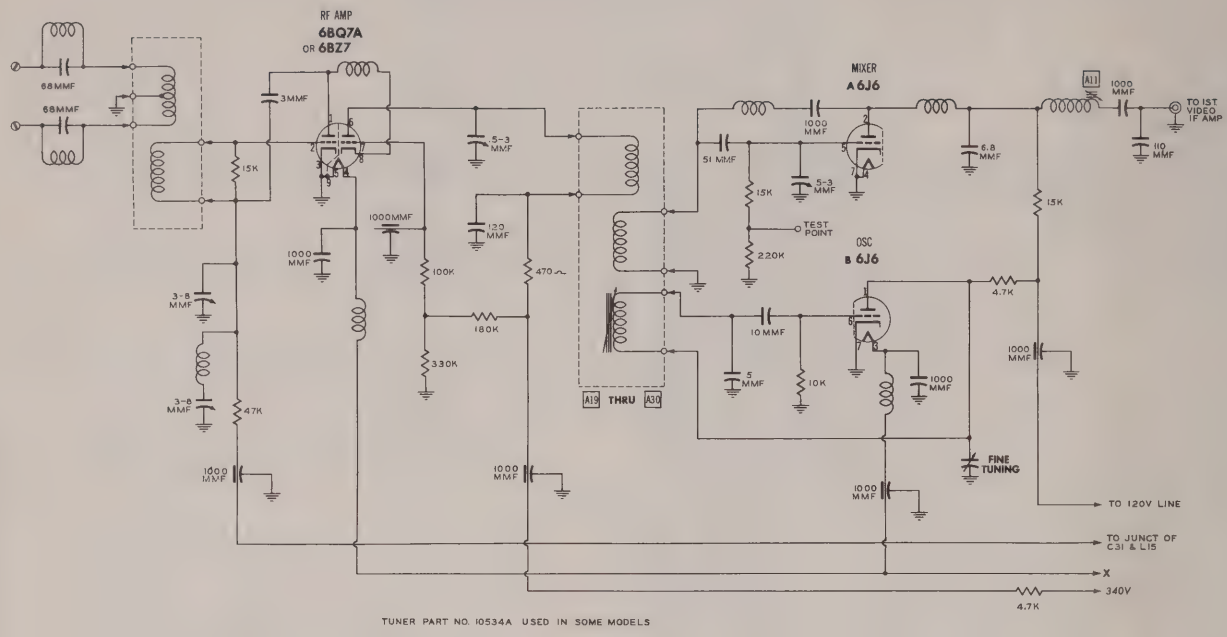
BUZZ

Adjust tuner fine tuning for best picture and sound. Adjust A16 for minimum buzz. If still unsatisfactory substitute V15 and realign ratio detector and audio IF stages.

DISTORTED

Follow procedure outlined under "Weak or No Sound".

CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION



TUNER PART NO. 10534A USED IN SOME MODELS

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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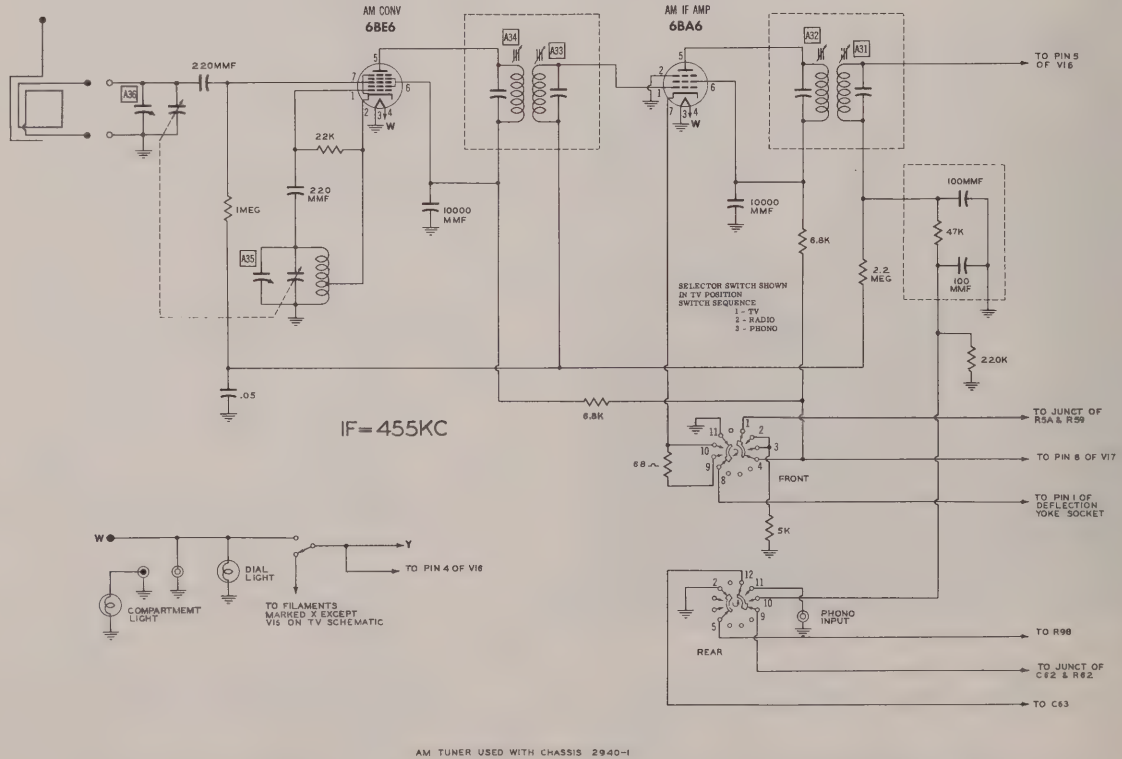
ALTERNATE TUNER SCHEMATIC



AM TUNER USED WITH CHASSIS 2940-1

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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PACKARD-BELL MODELS 2742, 2743, 2744, 2842, 2843, 2844 (Ch. 2740), 2941, 3041 (Ch. 2940, -1)

RADIO SCHEMATIC

PROPERTY OF
L. F. BLANKENSHIP
3324 MEADE ST.
DENVER, COLORADO

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA		RETMA BASE TYPE	NOTES
		Packard Bell PART No.	STANDARD REPLACEMENT		
V1A	UHF Oscillator	6AF4	6AF4	7DK	
B	UHF Oscillator	6T4	6T4	7DK	
V2	RF Amplifier	6BZ7	6BZ7	9AJ	
V3	Converter	6U8	6U8	9AE	
V4	1st Video IF Amp.	6CB6	6CB6	7CM	
V5	2nd Video IF Amp.	6CB6	6CB6	7CM	
V6	3rd Video IF Amp.	6CB6	6CB6	7CM	
V7	4th Video IF Amp.	6CB6	6CB6	7CM	
V8	Video Detector	6AL5	6AL5	6BT	
V9	Video Amp.	6AU6	6AU6	7BK	
V10	Video Output	6K6GT	6K6GT	7S	
V11	Noise Inverter	6AV6	6AV6	7BT	
V12	AGC Keying	6AU6	6AU6	7BK	
V13	Sound IF Amp.	6AU6	6AU6	7BK	
V14	Limiter	6CB6	6CB6	7CM	
V15	Ratio Detector	6AL5	6AL5	6BT	
V16	AF Amplifier	6AV6	6AV6	7BT	
V17	Audio Output	6V6GT	6V6GT	7S	
V18	Sync Separator Sync Phase Inv.	12AU7	12AU7	9A	
V19A	Vert. Mult.	6J5	6J5	6Q	
B	Vert. Mult.	6J5GT	6J5GT	6Q	
V20	Vert. Mult. Vert. Output	6S4	6S4	9AC	
V21	Horiz. AFC	6AL5	6AL5	6BT	
V22	Horiz. Mult	6SN7GT	6SN7GT	8BD	
V23A	Horiz. Discharge	6J5	6J5	6Q	
B	Horiz. Discharge	6J5GT	6J5GT	6Q	
V24A	Horiz. Output	6AU5GT	6AU5GT	6CK	
B	Horiz. Output	6AV5GT	6AV5GT	6CK	
V25	Damper	6AX4GT	6AX4GT	4CG	
V26	HV Rectifier	1B3GT	1B3GT	3C	
V27	LV Rectifier	5U4G	5U4G	5T	

CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA				RETMA BASE TYPE	NOTES
	Packard Bell PART No.	SYLVANIA PART No.	GENERAL ELECTRIC PART No.	WESTINGHOUSE PART No.		
V28	21YP4	21YP4 21XP4A ①	21YP4 21YP4A ①	21YP4 21YP4A ①	12L 12L	① Aluminized

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	Packard-Bell PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	▲40	450	24055	AFH3-159		C118		FP375	TVL-3764	
B	■40	450								
C	▲100	200								
C2A	▲40	450								
B	■40	450	24055	AFH3-159		C118		FP375	TVL-3764	
C	▲100	200								
C3A	▲5	75								
B	■5	75	24069	AFH4-101				FP424.1	R1316	
C	▲25	25								
D	100	15								
C4	40	350	24063	PRS450/40		BR4045A		TC78	TVA-1611	
C5	10	600	24068	PRS600/10		BRHV610		TC92	TVA-1955	
C6	50	50	24042							Note 1
C7A	1									
B	2									
C8	10									
C9	800			EF-001	MFT-1000				503C-D1	
C10	800			EF-001	MFT-1000				503C-D1	
C11	.5-3				829-3			CT565A		
C12	6.8			SI6.8NP0	TCZ-6.8	Z013	NP0K-6R8	ZT-5568	5TCCB-V68	
C13	1500			BPD-0015	DD-152	K071	801-0015	DC-5215	5HK-D15	
C14	3			SI3NP0	TCZ-3	Z007	NP0K-030		5TCCB-V3	
C15	800			EF-001	MFT-1000				503C-D1	
C16	.5-3				829-3			CT565A		
C17	1.5			SI1.5NP0	TCZ-1.5	Z004	NP0K-1R5	ZT-5515	5TCCB-V15	
C18	47			BPD-000047	D6-470	G033	GP1K-470	UC-5447	5GA-Q47	
C19	800			EF-001	MFT-1000				503C-D1	
C20	800			EF-001	MFT-1000				503C-D1	
C21	47									
C22	.5-3				829-3			CT565A		
C23	220			BPD-00022	D6-221	G051	GP2K-221	UC-5322	5GA-T22	
C24	10			SI10N750	TCN-10	N018	N750K-100	NT-541	5TCU-Q1	
C25	5									
C26	.5-3				829-3			CT565A		
C27	1500			BPD-0015	DD-152	K071	801-0015	DC-5215	5HK-D15	
C28	800			EF-001	MFT-1000				503C-D1	
C29	68			SI68N750	TCN-68	N038			5TCU-Q68	
C30	470		23916	BPD-00047	D6-471	K060	GP1K-471	UC-5347	5GA-T47	
C31	5000		23931	BPD-005	DD-502	K090	811-005	DC-525	5HK-D5	
C32A	10000		23962	BPD-2X01	DD3-103	DK082	811-01	DC-511	5HK-2S1	
B	10000						811-01	DC-511		
C33	2.2		23969	SI2.2NP0	TCZ-2.2	TZ05	NP0A-2R2		5TCCB-V22	
C34	22	500				5W5Q22				
C35	30	500				5W5Q33				
C36A	1500		23954	BPD-2X0015	DD3-152	DK-071	812-0015	DCD-5215	5HK-2D15	
B	1500									
C37	30	500				5W5Q3				
C38	4.7		23978	SI4.7NP0	TCZ-4.7	TZ07	NP0A-4R7	ZT-5547	5TCCB-V47	
C39	4.7		23978	SI4.7NP0	TCZ-4.7	TZ07	NP0A-4R7	ZT-5547	5TCCB-V47	
C40	30	500				5W5Q3				
C41A	1500		23954	BPD-2X0015	DD3-152	DK-071	812-0015	DCD-5215	5HK-815	
B	1500									
C42	1.0	100	23040	P484-1.0		CUB2W1		PT41	2TM-M1	
C43	4.7		23978	SI4.7NP0	TCZ-4.7	TZ07	NP0A-4R7	ZT-5547	5TCCB-V47	

PROPERTY OF
L. F. BLANKENEY
3924 MEADE ST.
DENVER, COLORADO

PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (cont)

ITEM No.	RATING CAP	RATING VOLT	Packard Bell PART No.	AEROVOX PART No	CENTRALAB/ DUBILIER PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No	SPRAGUE PART No.	NOTES
C44	22	500				22S5S22				
C45A	1500		23954	BPD-2X0015	DD3-152	DK071	812-0015	DCD-5215	5HK-S15	
B	1500									
C46	5		23908	S15N750	TCN-5	N0U	N750A-050	NT-555	5TCUB-V5	
C47	5000		23931	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C48	10		23927	SD10NP0	TCZ-10	TZ09	NP0A-100	ZT-541	5TCC-Q1	
C49	5000		23931	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C50	.05	300	23017	P288-05	DF-503	PJ385		PT415	2TM-S5	
C51	.1	600	23012	P688-1	DF-104	CUB6P1		PT601	6TM-P1	
C52	.1	300	23018	P384-1	DF-104	CUB9P1		PT401	4TM-P1	
C53	5000		23931	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C54	470	1000	23967	HVD15-470		VT47	IR5KV-331-471		10GA-T47	
C55	2.3		23969	SU2.2NP0	TCZ-2.2	TZ05	NP0A-2R2		5TCCB-V22	
C56	75			S1T5N750	TCN-75	TN19	N750B-750	ZT-5475	5TCU-Q75	
C57A	10000		23962	BPD-2X01	DD3-103	DK082	811-01	DC-511	5HK-2S1	
B	10000						811-01	DC-511		
C58	100		*23970	SM100	D6-101	TP-34	GP1K-101	UC-531	5GA-T1	
C59A	10000		23962	BPD-2X01	DD3-103	DK082	811-01	DC-511	5HK-2S1	
B	10000						811-01	DC-511		
C60	10000		23939	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C61	470		23918	BPD-00047	D6-471	K060	GP1K-471	UC-5347	5GA-T47	
C62	.003	900	23016	P688-003	D6-302	CUB9D3	GP2-333-302	PT623	6TM-D3	
C63	.02	600	23007	P688-02		CUB6S3		PT612	6TM-S2	
C64	10000		23939	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C65	10000		23939	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	Note 2
C66	.02	600	23007	P688-02		CUB6S2		PT612	6TM-S2	
C67	.01	600	23006	P688-01	D6-103	CUB6S1	GP2-333-103	PT611	6TM-S1	Note 3
C68	1500		23936	BPD-0015	DD-152	K071	801-0015	DC-5215	5HK-D15	
C69A	1000							PT922		
B	5000		*23951	*PA-110-1	*PC-100	*115TM1	*1405-01	PT625	*401C1	
C	5000							PT625		
C70	.002	600	23002	P688-002	D6-202	CUB6D2	GP2-333-202	PT622	6TM-D2	
C71	.05	600	23019	P688-05	DF-503	CUB6S5		PT615	6TM-S5	
C72	.01	600	23006	P688-01	D6-103	CUB6S1	GP2-333-103	PT611	6TM-S1	
C73	.5	200	23035	P288-5		PJ725		PT405	2TM-P5	
C74	200	2500	23958		D30-201				30GA-T2	
C75	.01	600	23006	P688-01	D6-103	CUB6S1	GP2-333-103	PT611	6TM-S1	
C76	1000	500	23219			BRD13				
C77	.001	600	23001	P688-001	D6-102	CUB6D1	GP2L-102	PT621	6TM-D1	
C78	.1	600	23012	P688-1	DF-104	CUB6P1		PT601	6TM-P1	
C79	1500		23936	SU150	D6-152	TP54	GP2L-152	UC-5215	5GA-D15	
C80	1500		23936	SU150	D6-153	TP54	GP2L-152	UC-5215	5GA-D15	
C81	5000		*23960	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C82	500	200	23017	P288-05	DF-503	PJ385		PT405	2TM-S5	
C83	4000	500	23208	1467-004		1R5D4		MCB463	M8-24	
C84	1200	500	23219			BRD12				
C85	.002	600	23002	P688-002	D6-202	CUB6D2	GP2-333-202	PT622	6TM-D2	
C86	5000		23931	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C87	270		23943	BPD-00027	D6-271	G064	GP1K-271	UC-5327	5GA-T27	
C88	10000		23939	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C89	5000		23931	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C90	.1	600	23012	P688-1	DF-104	CUB6P1		PT601	6TM-P1	
C91	.05	600	23010	P688-05	DF-503	CUB6S5		PT615	6TM-S5	
C92	.068	400	23041	P488-068		CUB4S68		PT4168	4TM-S68	
C93	500	20000	23959	HV20C	TV5-502	MMV-20T5	413	HV20035B	20DE-T5	
C94	.1	600	23012	P688-1	DF-104	CUB6P1		PT601	6TM-P1	
C95	47	2000	23956	HVD30-000047	D30-470				30GA-Q47	
C96	.01	125VAC	23932							
C97	.01	125VAC	23932							
C98	.1	600	23012	P688-1	DF-104	CUB6P1		PT601	6TM-P1	
C99	.02	600	23007	P688-02		CUB6S2		PT612	6TM-S2	
C100	5000		23931	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	Note 4
C101	10000		23939	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	Note 4
C102	5000		23931	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	Note 4

Note 1. Used on Chassis 2940-1 only.
Note 2. Early production models use .005MFD in this application.
Note 3. Chassis 2940-1 use .006MFD in this application (part #23004).
Note 4. Not used in all Models.
* Items C58 and R57 are combined in one unit.
◆ Items C69A, C69B, C69C, R76A, R76B, R78C are combined in one unit.
† Items C81 and R90 are combined in one unit.

CONTROLS

ITEM No	RATING RESISTANCE	RATING WATTS	Packard Bell PART No	IRC PART No	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	5000Ω		25850A	* QJ-462		SBBT-745-S	UF53R	Contrast - Panel
B	500KΩ		Not Req.				UR557154	Volume tapped at 100K-rear
C	Switch		Not Req.				US-25	Attach to R1B
R2A	5000Ω	2	25845	WK-5000	A43-5000	V-135	R5000L	Vert. Linearity wire wound
B	Shaft		Not Req.	Not Req.	KS8-3	Not Req.	DS-36	Attach to R2A
R3A	100Ω	2	25946	W-100	A43-100	V-131	R100L	Automatic noise Inv.
B	Shaft		Not Req.	Not Req.	KS8-3	Not Req.	DS-36	Attach to R3A
R4A	500KΩ		25513	QU-133	AG-58-8	AB-59	U-50	Tone
B	Shaft		Not Req.	Not Req.	KS8-3	AK-4	Not Req	Attach to R4A
R5A	500KΩ		25848	◆ QJ-461		SBB-738	UF558	Brightness - Panel
B	150KΩ		Not Req.				UR356L	Vert. Hold - Rear
R6A	3 Meg		25847	■ QJ-460		SBB-737		Focus - Panel
B	3 Meg		Not Req.					Height - Rear
R7A	150KΩ		25839C	QU-139	AG-52-8	AB-46	U-43	Horiz. Drive
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R7A

RESISTORS

ITEM No.	RATING OHMS	RATING WATT	Packard Bell PART No	IRC PART No.	NOTES
R8	10KΩ	1		BTS-10K	
R9	1000Ω	1		BTS-1000	
R10	22KΩ	1		BTS-22K	
R11	47K	1		BTS-47K	
R12	270KΩ	1		BTS 270K	
R13	180KΩ	1		BTS 180K	
R14	680Ω	1		BTS 680	
R15	15KΩ	1		BTS-15K	
R16	100KΩ	1		BTS-100K	
R17	100KΩ	1		BTS-100K	
R18	100KΩ	1		BTS-100K	
R19	10KΩ	1		BTS-10K	
R20	33000Ω	1		BTA-3303	
R21	33KΩ	1		BTS-33K	
R22	82000Ω	1		BTS-8200	
R23	4700Ω	1		BTS-4700	
R24	47000Ω	2	73433	BTD-4700	Note 3
R25	1800Ω	1	73028	BTS-1800	
R26	120Ω	1	73014	BTS-120	
R27	68Ω	1	73011	BTS-68	
R28	100Ω	1	73013	BTS-100	
R29	12KΩ	1	73038	BTS-12K	
R30	100Ω	1	73013	BTS-100	
R31	100Ω	1	73013	BTS-100	
R32	120Ω	1	73014	BTS-120	
R33	120Ω	1	73014	BTS-120	
R34	3300Ω	1	73031	BTS-3300	
R35	68Ω	1	73011	BTS-68	
R36	100Ω	1	73013	BTS-100	
R37	3300Ω	1	73031	BTS-3300	
R38	180Ω	1	73016	BTS-180	
R39	47Ω	1	73009	BTS-47	
R40	2700Ω	1	73030	BTS-2700	
R41	3900Ω	1	73032	BTS-3900	
R42	22KΩ	1	73041	BTS-22K	
R43	470KΩ	1	73157	BTS-470K	
R44	3900Ω	2	72432	BTD 3900	
R45	1 Meg	1	73161	BTS-1 Meg	
R46	1 Meg	1	73161	BTS-1 Meg	
R47	33KΩ	1	73043	BTS-33K	
R48	47KΩ	1	73045	BTS-47K	
R49	100KΩ	1		BTS-100K	
R50	47KΩ	1	73045	BTS-47K	
R51	100KΩ	1	73047	BTS-100K	
R52	3300Ω	1	73031	BTS-3300	
R53	100KΩ	1	73149	BTS-100K	
R54	10KΩ	1		BTS-10K	Note 1
R55	120Ω	1	73014	BTS-120	
R56	68000Ω	1	73235	BTA-6800	
R57	22KΩ	1	*	BTS-22K	
R58	120Ω	1	73014	BTS-120	
R59	1000Ω	1	73025	BTS-1000	
R60	33KΩ	2	73443	BTD-33K	
R61	82Ω	1		BTS-82	Note 3
R62	22KΩ	1	73041	BTS-22K	
R63	10KΩ	1	73037	BTS-10K	

ITEM No.	RATING OHMS	RATING WATT	Packard Bell PART No	IRC TYPE No.	NOTES
R64	10KΩ	1	73037	BTS-10K	
R65	33KΩ	1	73043	BTS-33K	
R66	4.7Meg	1	73189	BTS-4.7Meg	
R67	150KΩ 5%	1	73051-1	BTS-150K 5%	
R68	470KΩ	1	73157	BTS-470K	
R69	1.5Meg	1	73163	BTS-1.5Meg	Note 1
R70	100KΩ	1	73149	BTS-100K	
R71	270KΩ 5%	1	73054-1	BTS-270K	
R72	470Ω	2	73421	BTD-470	
R73	4.7Meg	1	73169	BTS-4.7Meg	
R74	2200.	1	73029	BTS-2200	
R75	1.5Meg	1	73163	BTS-1.5Meg	
R77	3300Ω	1	73031	BTS-3300	
R77	3300Ω	1	73031	BTS-3300	
R78A	22KΩ	1		BTS-22K	
B	82000Ω	1	◆	BTS-8200	
C	82000Ω	1		BTS-8200	
R79	68KΩ	1	73047	BTS-68K	
R80	470KΩ	1	73157	BTS-470K	
R81	22KΩ	1	73041	BTS-22K	
R82	1 Meg	1	73161	BTS-1 Meg	
R83	150KΩ	1	73151	BTS-150K	
R84	100KΩ	1	73149	BTS-100K	
R85	12KΩ 5%	1	73038-1	BTS-12K 5%	
R86	2.2Meg	1	73165	BTS-2.2Meg	
R87	820Ω	1	73224	BTA-820	
R88	150KΩ	1	73151	BTS-150K	
R89	560Ω	1		BTS-560	
R90	560Ω	1		BTS-560	
R91	1000Ω	1		BTS-1000	
R92	100	1		BTS-100	
R93	100KΩ	1	73149	BTS-100K	
R94	100KΩ	1	73149	BTS-100K	
R95	4.7Meg	1	73169	BTS-4.7Meg	
R96	470KΩ	1	†	BTS-470K	
R97	100KΩ	1	73149	BTS-100K	
R98	150KΩ	1	73027	BTS-1500	
R99	5600Ω	1	73034	BTS-5600	
R100	12KΩ	1	73038	BTS-12K	
R101	100KΩ	1	73249	BTA-100K	
R102	220KΩ	1	73153	BTS-220K	
R103	22KΩ	1	73041	BTS-22K	
R104	100KΩ	1	73052	BTS-100K	
R105	470KΩ	1	73157	BTS-470K	
R106	500Ω	10	73616	1 3/4A-500	
R107	100Ω	3	73437	BTS-100K	
R108	5600Ω	2	73434	BTD-5600	
R109	3.3Ω	1	73291		
R110	1 Meg	1	73398	BTA-1 Meg	
R111	1 Meg	1	73398	BTA-1 Meg	
R112	100KΩ	1	73149	BTS-100K	
R113	5000	5			Note 1
R114	22Ω	1		BTS-22	Note 1
R115	100Ω	1	73019	BTS-100	Note 1
R116	22KΩ	1	73041	BTS-22K	Note 4
R117	470Ω	1		BTS-470	Note 4

◆ Items R78A, R78B, R78C, C69A, C69B, C69C are combined in one unit.
† Items R96 and C81 are combined in one unit.
* Items C58 and R57 are combined in one unit.
Note 1. Not used in all models.
Note 2. Some models may use a 50000 5 watt resistor in this application.
Note 3. Some models may use a 4700 resistor in this application.
Note 4. Used only when radio detector transformer # 29054 is used.

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	Packard-Bell PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	RCA TYPE No.	Halldorson PART No.	Thordarson PART No.
T1	117VAC ⑥ 1.9A.	665VCT .220ADC	5VAC ⑤ 3A	29043	P-8165 ①	P-3070	R-39BC			
		SEC. 3	SEC. 4	SEC. 5						
		6.3VAC 1.3A	6.3VAC ⑥ 9.2A							

① Use high tape only on high voltage secondary.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	Packard-Bell PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	RCA TYPE No.	Halldorson PART No.	Thordarson PART No.
T2	Horiz. Output Trans.	29438	A-8232①④		D-22	225TI ③		FLY-12③
T3	Vert. Output Trans.	29434	A-8141	A-3039	A-104X	228TI	21806	T-26854
T4A	Yoke-Horiz.(2F-5MH)	29542	DY-11A	MDF-73	Y-23④	228DI	DF605	
B	Yoke-Vert. (37MH)							
T5	Horiz.Lin.Coil (1.1-5MH, tapped)	29531	WC-8	MWC-5①		207RI		
T6	Width Coil (1-9MH)	29540	WC-8	MWC-6①	WC-12⑥	21RI		WC-17

① Drill new mounting holes.
② Connect original terminal #9 to new terminal #2, original #8 to new #7, original #7 and #5 to new #5, original "T" to new #4, original #3 to new #6, original #1 to new #8.
③ Connect as in original circuit except, connect original "T" to new #4.
④ Use original yoke network.
⑤ Enlarge mounting hole.
⑥ Connect to coded blue and green terminals.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI	IMPEDANCE SEC	Packard-Bell PART No	Stancor PART No	Merit PART No	Triad PART No	Halldorson PART No	Thordarson PART No	NOTES
T7	4.5KΩ	3.3Ω	89436	A-3877	A-2930	S-3X	Z1107		

SPEAKER

ITEM No.	RATINGS SIZE	RATINGS FIELD	RATINGS V C IMP	Packard-Bell PART No	VIKING PART No	GUAM PART No	NOTES
SP1	10"	PM	3.5Ω	83705	107U	10A4A	

COILS (RF-IF)

ITEM No.	USE	DC RES PRI	DC RES SEC.	Packard Bell PART No.	MEISSNER PART No	MERIT PART No	MILLER PART No	NOTES
L1	UHF Ant. Coil	0Ω						
L2	UHF Ant Coil	0Ω						
L3	RF Choke	0Ω						
L4	UHF Ant., Mixer & Osc. Coils	0Ω						
L5A	Fil. Choke	0Ω						
B	Fil. Choke	0Ω						
L6	Cathode Choke	0Ω						
L7	UHF IF Input Coil	0Ω	.3Ω					
L8	UHF IF Coil	.2Ω	.2Ω					
L9	UHF IF Coil	.2Ω						
L10	VHF Ant.Coil	0ΩCT	0Ω					
L11	Neutr. Coil	0Ω						
L12	VHF RF, Mixer grid & Osc. Coils	0Ω						
L13	Fil. Choke	0Ω						
L14	Conv. Plate	.1Ω						
L15	RF Choke	1.8Ω		29566	19-1005		4612	10 Microhenries
L16	1st Video IF	.1Ω		29559	20-1045 †		6219 †	
L17	47.25MC Trap	0ΩCT		29564	20-1047		6219 †	
L18	39.75MC Trap	0Ω		29565	20-1046			
L19	2nd Video IF	.1Ω	.1Ω	29561A	17-4523		6219	
L20	3rd Video IF	.1Ω	.1Ω	29570A				Includes trap
L21	39.75MC Trap	0Ω		29565	20-1046			
L22	Fil. Choke			29551	19-3001	TV-189	6175	Not used in all models; .8 Microhenry
L23	4th Video IF	.1Ω	.1Ω	29561A	17-4523		6219	
L24	47.25MC Trap	0ΩCT		29564	20-1047		6219 †	
L25	5th Video IF	.1Ω	.1Ω	29572A	17-4523		6219	
L26	Series Peak. Coil	7Ω		29552	19-3093 *	TV-181 *	6177 *	93 Microhenries; wound on 3.9KΩ resistor
L27	4.5MC Trap	8.9Ω		29548	20-1008 ■	TV-181	1470	
L28	Shunt Peak. Coil	12Ω		29509	19-3250	TV-185	6181	250 Microhenries
L29	Series Peak. Coil	8Ω		29506	19-3125 *	TV-182	6178	130 Microhenries; wound on 22KΩ resistor
L30	Series Peak. Coil	3.8Ω		29520	19-3096	TV-180	6176	36 Microhenries
L31	Shunt Peak. Coil	8.5Ω		29507	19-3093	TV-181	6177	93 Microhenries
L32	1st Sound IF	1.1Ω		29053	17-3400	TV-181	1469	
L33	2nd Sound IF	3.1Ω	1.8Ω	29541	16-3445	TV-113 ▲	1466 ▲	
L34	Ratio Det.	7Ω	1.3ΩCT	29068	17-3493	TV-115	1498	See note 1; tertiary - winding= .45Ω
L35	Horiz. Osc.	110Ω		29527	19-1676	TV-163	6310	

† Use one winding only.
* Parallel with 3.9KΩ resistor.
■ Disconnect capacitor in parallel.
◆ Parallel with 22KΩ resistor.
▲ Use adaptor plate.
▪ Drill one new mounting hole.
Note 1. Late production chassis use ratio Det. Part # 29054.

FILTER CHOKE

ITEM No	TOTAL DIRECT CURRENT	D C. RESISTANCE	INDUCTANCE (0 CURRENT 1000 ⁰/₀)	Packard-Bell PART No	Stancor PART No	Merit PART No	Triad PART No	Halldorson PART No	Thordarson PART No
L36	.220ADC	41Ω	1.6 Hy.	27005	C-2328 ①	C-2996	C-17X ①	C5037 ①	

① Drill one new mounting hole.

FUSES

ITEM No.	TYPE	RATING	Packard-Bell PART No	HOLDER	LITTELFUSE PART No	HOLDER	BUSS PART No.	HOLDER
M1	3AG S/B	1/4A 250V	45005		313.250 (3AG S/B L'4A)	357001	MDL 1/4	4405

PACKARD-BELL MODELS 2742, 2743, 2744, 2842, 2843, 2844 (Ch. 2740), 2941, 3041 (Ch. 2940, -1)

PARTS LIST AND DESCRIPTIONS (Continued)

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA			NOTES
		Packard-Bell PART No.	SYLVANIA PART No.		
M2	1N82		1N82		UHF Mixer (Clip-in)

MISCELLANEOUS

ITEM No.	PART NAME	Packard-Bell PART No.	NOTES
M3	Dial Light	54002	#47 Bayonet
M4	Tuner	10534A	VHF
M5	Tuner	10535C	VHF/UHF Dual unit
M6	Trap		Antenna-VHF
M7	Switch		TV-Phono
M8	Focus Magnet	28075	
M9	Ion Trap	28106	
	Cabinet		Order by model number & type of finish
	Knob	52085G	Fine tuning - specify cabinet finish
	Knob	52086D	Volume - specify cabinet finish
	Knob	52087G	Contrast - specify cabinet finish
	Knob	52089D	Channel Selector - Specify cabinet finish
	Knob	52080	(2) TV-phono & tone - Specify cabinet finish

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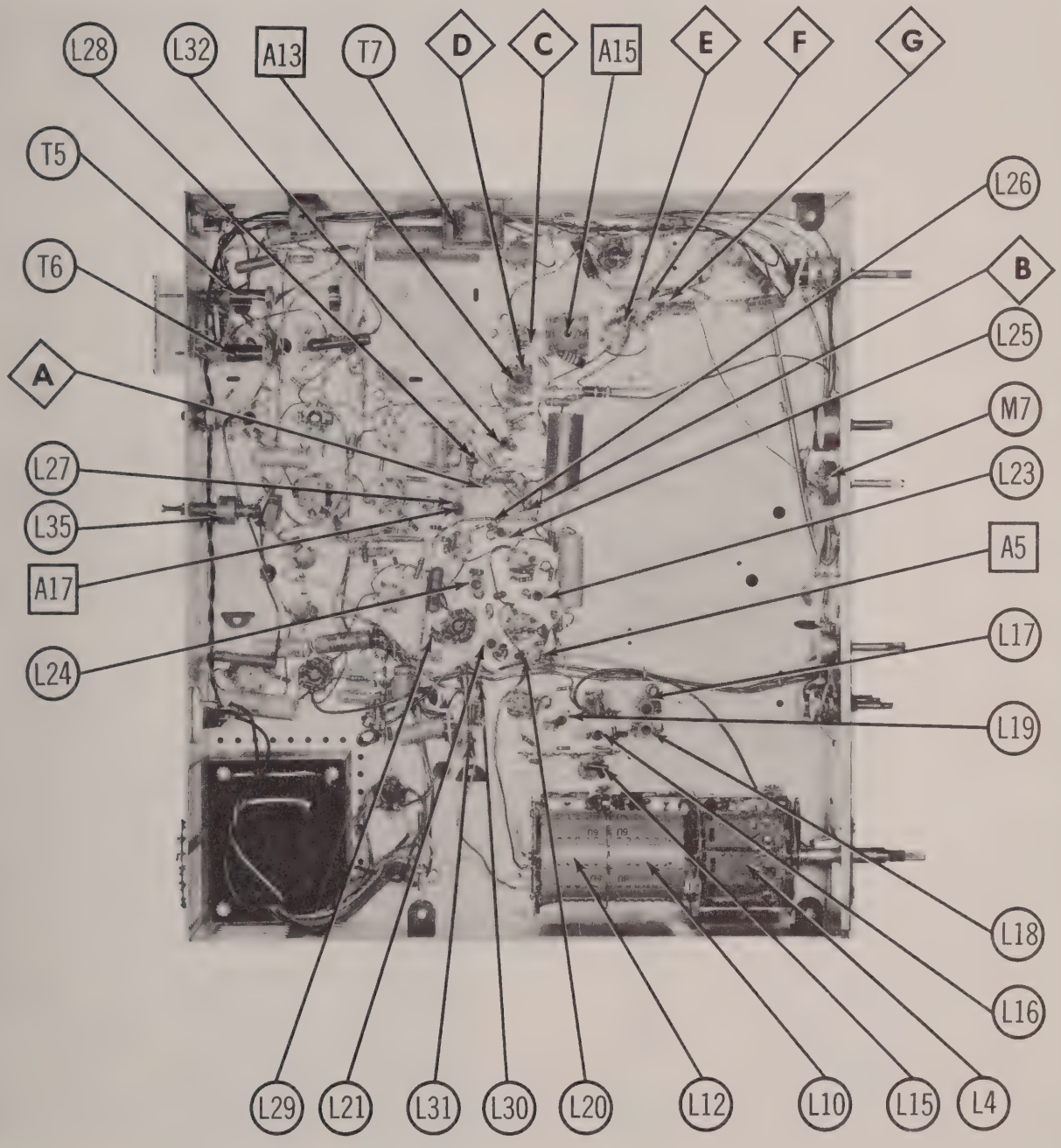
DENVER, COLORADO



CHASSIS BOTTOM VIEW-TRANS., INDUCTOR AND ALIGNMENT IDENTIFICATION

TROUBLE SHOOTING AIDS (cont)

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POWER

DEAD SET

If filaments fail to light, check AC interlock switch on volume control and T1. If filaments light, substitute V27. Check B+ filter and decoupling network components.

SMALL AND/ OR DIM PICTURE

Substitute V27. Check B+ filter and decoupling network components for failure.

HIGH VOLTAGE

LOSS OF HIGH VOLTAGE

Check fuse M1. Check by substitution V23, V24, V25 and V26. Check waveform W18.

If Satisfactory	If Unsatisfactory
Check R109, R110, R111, C93, T2, T4A and other associated components.	Check C86, C89, R101, R104, R105, R102 and other associated components.

BLOOMING

Check by substitution V23, V24, V25, V26 and V27. Check R109, R110, R111, C93, C90, T2, T4A, and other associated circuit components.

INSUFFICIENT HIGH VOLTAGE

Check by substitution V23, V24, V25, V26 and V27. Check picture tube. Proceed as outlined under "Loss of High Voltage".

GENERAL

RASTER SOUND NO PICTURE

Follow procedure outlined under "Loss of Video".

RASTER PICTURE NO SOUND

Follow procedure outlined under "Weak or No Sound".

RASTER NO SOUND NO PICTURE

Check by substitution V2, V3, V4, V5, V6, V7 and V8. Check associated circuit components. In case of UHF check V1.

NO RASTER NO SOUND

Follow procedure outlined under "Dead Set".

KEYSTONE EFFECT

Check T4, C95, R89, R90 and R91.

INTERMITTENT STREAKS

Check video signal for interference pulses. Check high voltage. section for corona discharge and arcing.

Symptoms shown are assumed and are not indicative of the quality and workmanship of this equipment.

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustments of the RF tuner oscillator circuit may be accomplished by removal of the channel selector and fine tuning knobs. The adjustments are accessible, one at a time, thru the small hole in the cabinet to the right of the channel selector shaft.

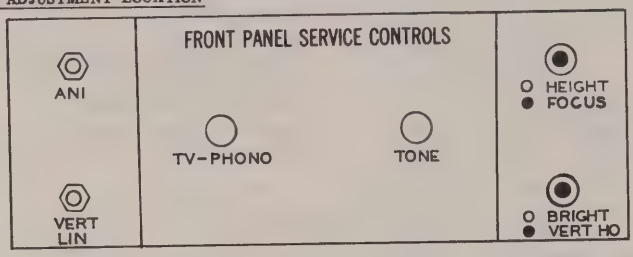
PICTURE TUBE SAFETY GLASS CLEANING

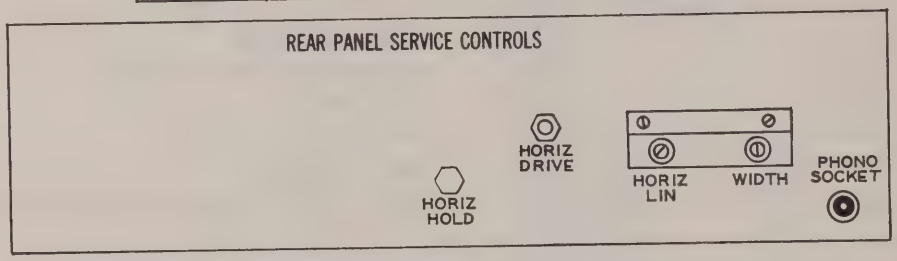
To clean safety glass, remove 3 wood screws holding wood strip at top of safety glass. Remove wood strip and safety glass. Use extreme caution when removing safety glass.

PICTURE TUBE REMOVAL

For picture tube removal it is necessary to remove chassis. (See disassembly instructions).

SERVICE ADJUSTMENT LOCATION





SPECIAL ADJUSTMENTS - AUTOMATIC NOISE INVERTER

The ANI (automatic noise inverter) control should be adjusted at the location where the receiver is to be used. Tune in the weakest signal available and proceed as follow:

1. Turn ANI control fully counter clockwise.
2. Turn control clockwise until picture begins to distort.
3. Turn control counter clockwise slightly beyond the point where the distortion disappears.
4. Check picture stability on all channels. If control is not adjusted on weakest signal available, synchronization may be lost on some other channel.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

Adjustment of the horizontal oscillator circuit can be made from the rear panel of the chassis. Adjust the horizontal hold slug (L35) until the picture synchronizes horizontally. If synchronization cannot be obtained by the above adjustment see horizontal sweep circuit adjustment on page 11.

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate sound IF detector buzz, adjust the ratio detector secondary (L34) located on top of chassis. (See tube placement chart).

FUSES

One fuse is used for horizontal sweep circuit protection. (For location, see tube placement chart).

CENTERING

Centering is accomplished mechanically by means of a centering lever on the PM focusing assembly. Adjust the centering lever from side to side, and up and down until the picture is properly centered.

DISASSEMBLY INSTRUCTIONS

1. Remove 7 push type control knobs from front panel.
2. Remove 13 wood screws. Remove 2 rear covers.
3. Disconnect speaker plug.
4. Remove 4 chassis bolts. Remove chassis.
5. Remove 4 speaker screws. Remove speaker.

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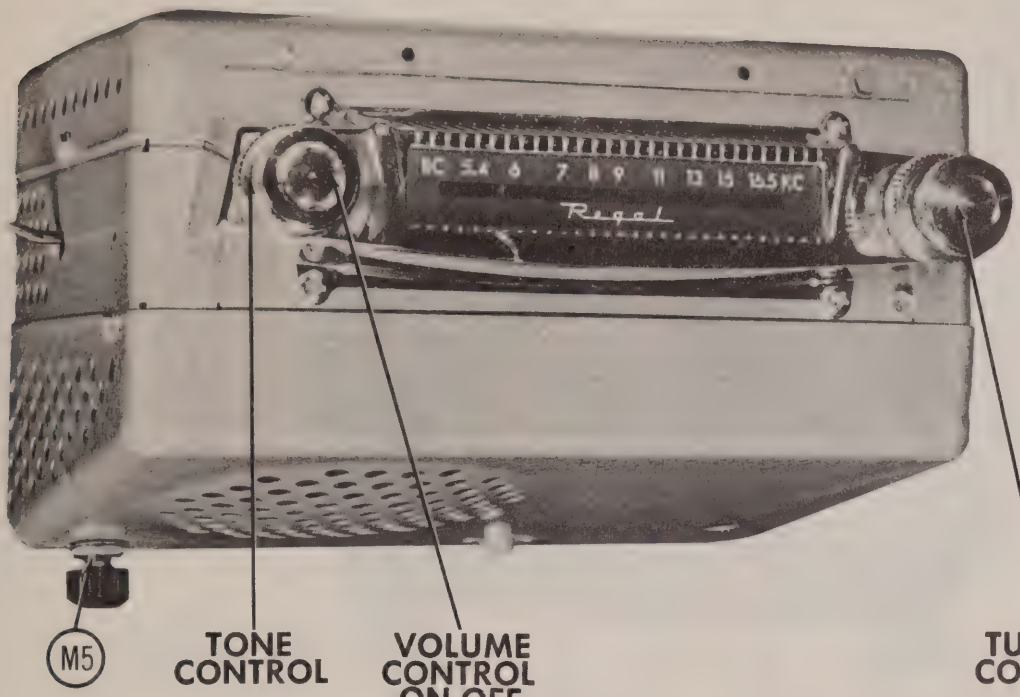
REGAL
MODEL CR871



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REGAL
MODEL CR871

TRADE NAME	Regal Model CR871
MANUFACTURER	Regal Electronics Corp., 605 W. 130th. St., New York, N.Y.
TYPE SET	Battery Operated AM Superheterodyne Receiver for Automobiles
TUBES (Six)	Types 6BA6 RF Amp., 6BE6 Conv., 6BA6 IF Amp., 6AT6 Det.-AVC-AF Amp., 6AS5 Audio Output, 6X4 Rectifier
POWER SUPPLY	6 Volt Storage Battery — RATING 5.3 Amp. @ 6.3 Volts DC
TUNING RANGE—BROADCAST	540-1680KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
To set pointer, turn tuning capacitor fully closed and set pointer to last reference mark at low frequency end of dial.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 7 (grid) of 6BE6 (V2). Low side to chassis.	456KC (400~Mod)	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output.
2.	"	High side to antenna stator lug on tuning gang. Low side to chassis.	1680KC	"	"	A5	"
3.	"	"	1500KC	Tune to 1500KC signal	"	A6, A7	"
4.	"	"	600KC	Tune to 600KC signal	"	A8	"
5.	30MMF	High side thru 30MMF in series with standard auto set antenna cable. Low side to chassis.	1500KC	Tune to 1500KC signal	"	A9	"

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA		RETMA BASE TYPE	NOTES
		REGAL PART No.	STANDARD REPLACEMENT		
V1	RF Amplifier	6BA6	6BA6	7BK	
V2	Converter	6BE6	6BE6	7CH	
V3	IF Amplifier	6BA6	6BA6	7BK	
V4	Det-AVC-AF Amp.	6AT6	6AT6	7BT	
V5	Audio Output	6AS5	6AS5	7CV	
V6	Rectifier	6X4	6X4	5BS	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	REGAL PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	■20	200		AFH3-107		C071		FP330	TVL-3565	
B	▲20	200								
C	25	25								
C2	.05	200		P288-05	DF-503	PJ2S5		PT415	2TM-S5	
C3	360			SI360N750	TCN-360	TN35	GP2K-361		5GA-T36	
C4	82			SI82N750	TCN-820	TN20	N750T-820			
C5	680	500		1479-0007		1W5T68			MS-37	
C6	.25	200		P288-25		PJ2P25		PT4025	2TM-P25	
C7A	220									
B	2000									
C	5000			♦PA-113-1	♦PC-150	♦116TM1	♦1408-01		♦103C4	
D	250									
E										
C8	.005	400		P488-005	D6-502	CUB4D5	GP2-333-502	PT425	4TM-D5	
C9	.01	400		P488-01	D6-103	CUB4S1	GP2-333-103	PT411	4TM-S1	
C10	.5	100		VHC-36		MP2P5		RF480	HC-3	
C11	.5	100		VHC-36		MP2P5		RF480	HC-3	
C12	.01	1600		P1688-01		CUB16S1		PT1611	MB-S1	

♦ Items C7A, C7B, C7C, C7D, C7E, R9A, R9B and R9C are combined in one unit.
When replacing items separately items C7D and C7E should total 250MMF.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESIST-ANCE	WATTS	REGAL PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1A	500KΩ	½	20-133A				UF55A	Tone (Panel)
B	500KΩ	½					UR55A	Volume (Rear)
C	Switch						US-26	Attach to R1B

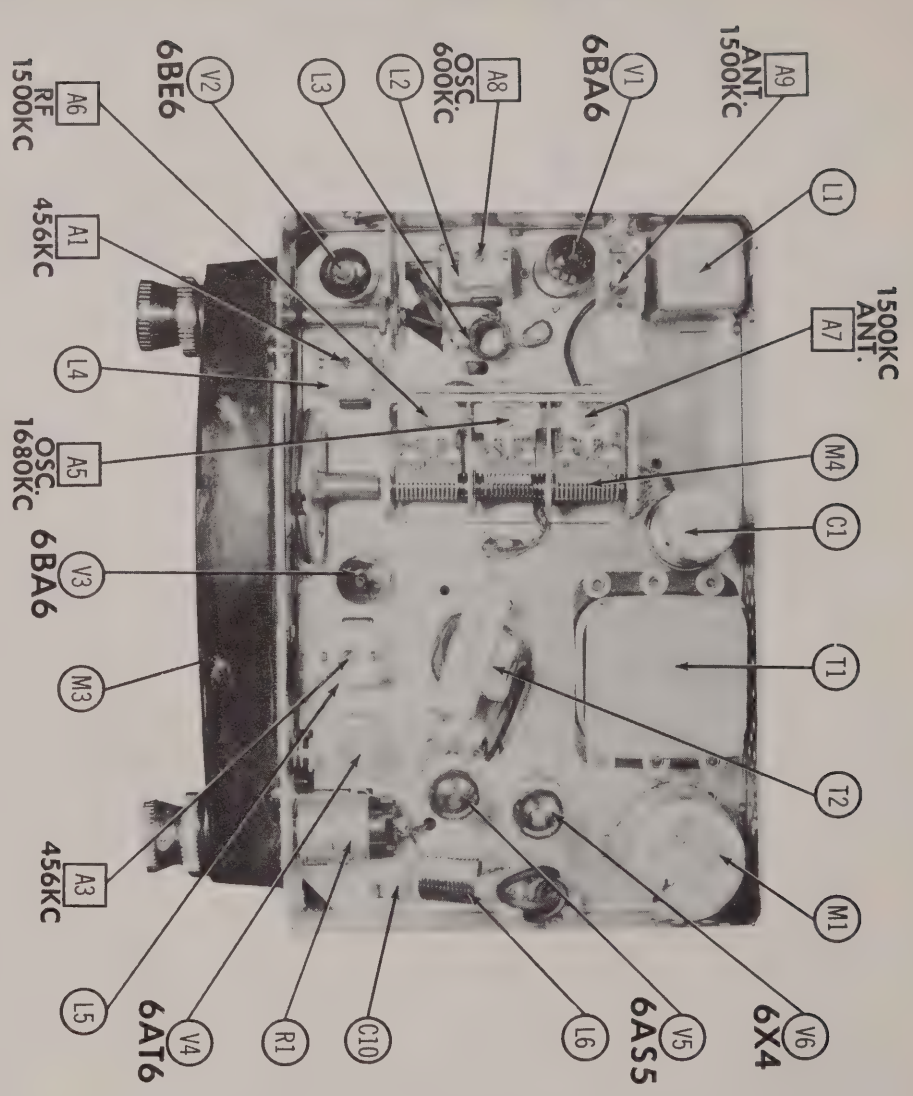
RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	REGAL PART No.	IRC PART No.	
R2	1.5Meg	½		BTS-1.5Meg	
R3	82Ω	½		BTS-82	
R4	22KΩ	½		BTS-22K	
R5	1.5Meg	½		BTS-1.5Meg	
R6	220Ω	½		BTS-220	
R7	3000Ω	1		BTA-3000	
R8	2.2Meg	½		BTS-2.2Meg	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	REGAL PART No.	IRC PART No.	
R9A	6.8Meg	½		BTS-6.8Meg	
B	470KΩ	½		BTS-470K	
C	470KΩ	½		BTS-470K	
R10	2.2Meg	½		BTS-2.2Meg	
R11	220Ω	½		BTS-220	
R12	2000Ω	2		BTB-2000	
R13	68Ω	1			
R14	68Ω	1			

♦ Items R9A, R9B, R9C, C7A, C7B, C7C, C7D, C7E are combined in one unit.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA					
	PRI.	SEC. 1	SEC. 2	SEC. 3	REGAL PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.
T1	6.3VCT @ 2.5A	314VCT .050ADC								22R26 ①

① Drill new mounting holes.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	REGAL PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.	
T2	3KΩ	3.1Ω		A-3856	A-3031	S-51X	Z1107	TS-24S50	

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	REGAL PART No.	JENSEN PART No.	QUAM PART No.	
SP1	5"	PM	3.1Ω		ST-105 Mod P5-X	5A07	

COILS (RF-IF)

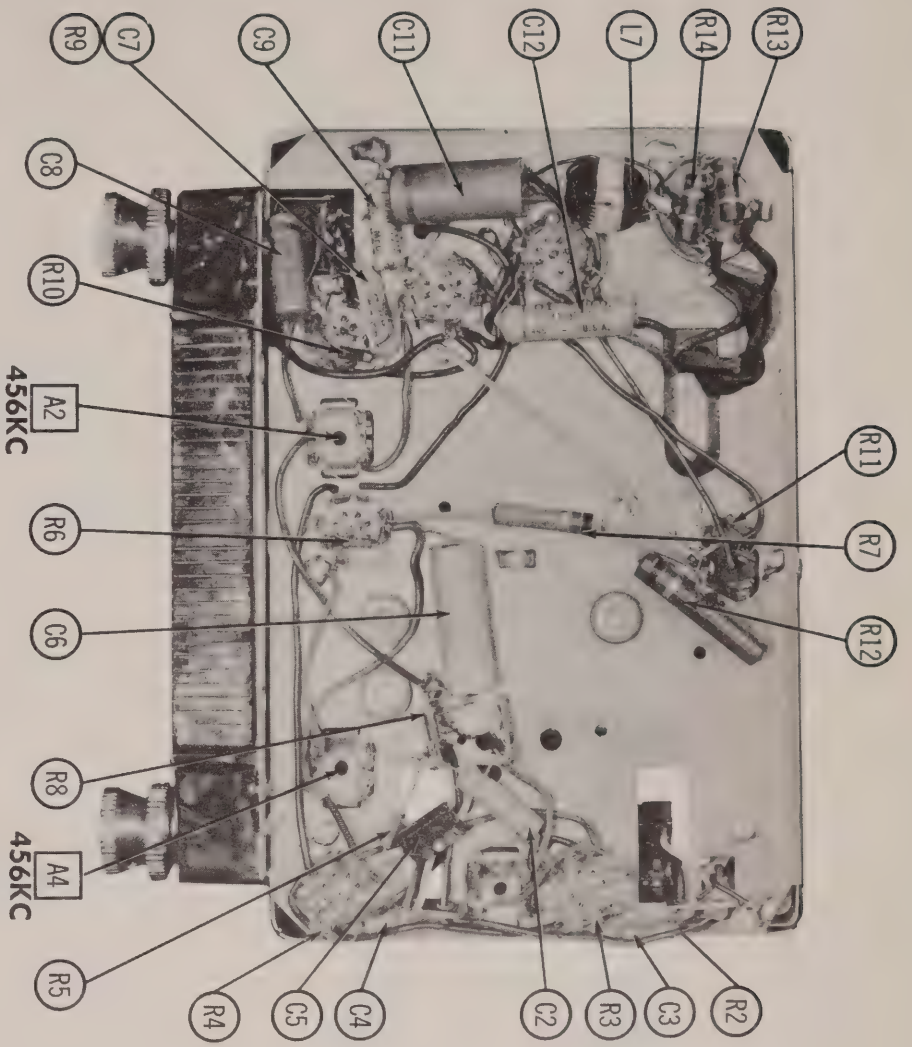
ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	REGAL PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Ant. Coil	2.1Ω		30-259		BC-390 *	A-121-A *	Tapped @ 1.4Ω
L2	RF Coil	100Ω	4.6Ω	30-267				
L3	Osc. Coil	5.5Ω			14-1033 †	BC-400 †	71-Osc. †	Tapped @ .7Ω
L4	Input IF	15Ω	15Ω	30-154	16-6758	BC-352	12-C1	
L5	Output IF	9.5Ω	9.5Ω	30-155	16-6758	BC-353	12-C2	
L6	Fil. Choke	0Ω					5221	2 Microhenries
L7	Vibrator-Hash Choke	0Ω					5221	9 Microhenries

† Drill mounting hole.
* Cut out chassis hole and use clip mounting.

VIBRATOR

ITEM No.	TYPE	INPUT VOLTS	FREQUENCY	REPLACEMENT DATA				NOTES
				REGAL PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	RADIART PART No.	
M1	Interrupter	6.3	115		5301	859	5301	

CHASSIS—BOTTOM VIEW



SET 238

FOLDER 11

PARTS LIST AND DESCRIPTIONS (Continued)

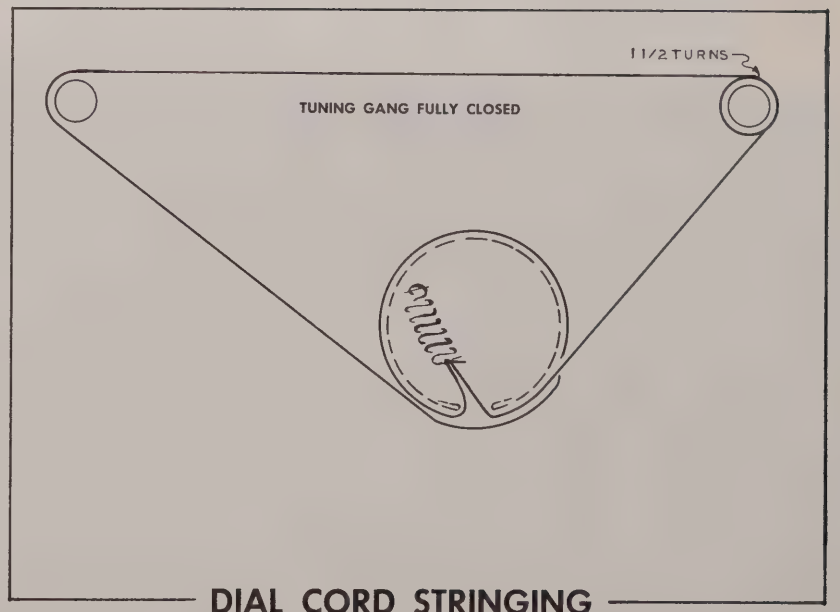
FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			REGAL PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M2	SFE	14A			307014. (SFE-14A)	155014	SFE14	HDI

MISCELLANEOUS

ITEM No.	PART NAME	REGAL PART No.	NOTES
M3	Dial light		# 47 bayonet
M4	Tuning cap	40-148	3 section (18-427MMF) (28-452MMF) (37-210MMF)
M5	Switch		Speaker select
A9	Trimmer cap	40-112	Antenna

CHASSIS—BOTTOM VIEW



DIAL CORD STRINGING

PROPERTY OF
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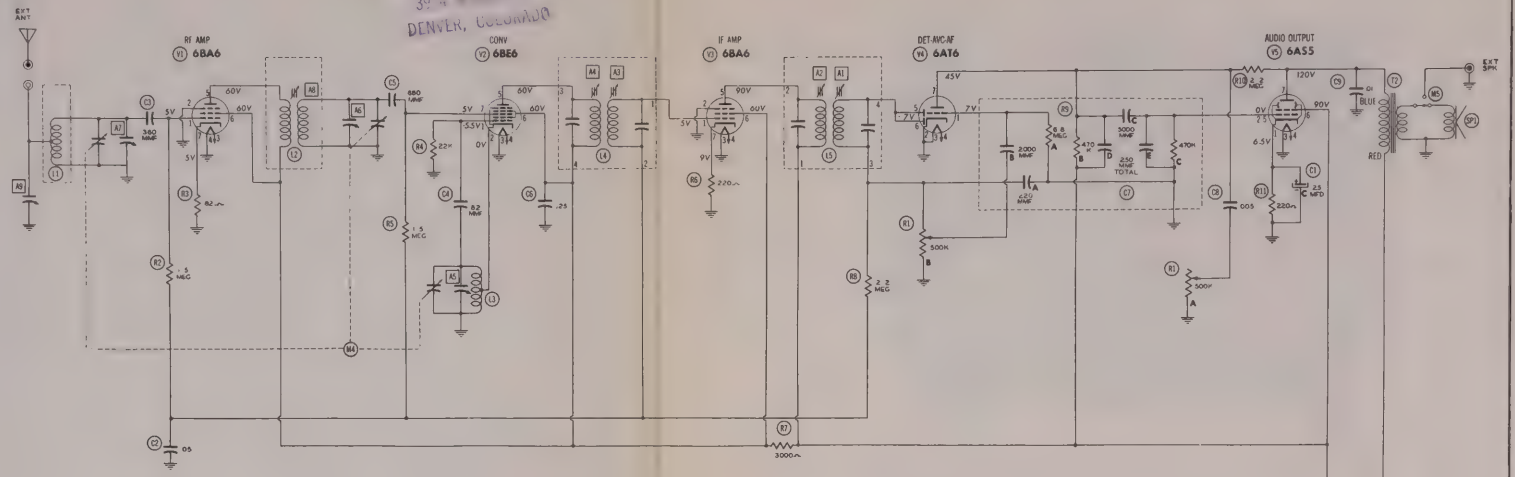
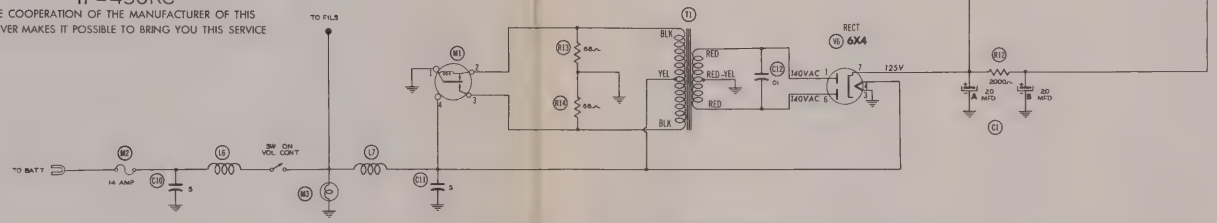
30[illegible]
DENVER, COLORADO



IF=456KC

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE



RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	6BA6	4.2Meg	0Ω	.5Ω	0Ω	†5KΩ	†5KΩ	82Ω
V 2	6BE6	22KΩ	0Ω	0Ω	.5Ω	†5KΩ	†5KΩ	4.2Meg
V 3	6BA6	2.7Meg	0Ω	0Ω	.5Ω	†2KΩ	†5KΩ	220Ω
V 4	6AT6	6.8Meg	0Ω	0Ω	.5Ω	500KΩ	500KΩ	†470KΩ
V 5	6AS5	220Ω	470KΩ	0Ω	.5Ω	470KΩ	†2KΩ	† 140Ω
V 6	6X4	250Ω	.5Ω	0Ω	.4Ω	265Ω	265Ω	150KΩ

† MEASURED FROM PIN 7 OF V6

1. DC voltage measurements taken with vacuum tube voltmeter.
2. AC voltages measured at 1000 ohms per volt.
3. Socket connections are shown as bottom views.
4. Measured values are from socket pin to common negative.
5. Battery voltage maintained at 6.3 volts for voltage readings.
6. Nominal tolerance on components values makes possible a variation of ± 10% in voltage and resistance readings.
7. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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L. F. ELECTRONICS
DENVER, COLORADO

ROLAND
MODEL 5T4

VOLUME CONTROL ON-OFF SWITCH

TUNING CONTROL

ROLAND
MODEL 5T4

TRADE NAME	Roland Model 5T4
MANUFACTURER	Roland Radio Corp., 12-30 Anderson Ave., Mt. Vernon, N.Y.
TYPE SET	AC-DC Operated AM Superheterodyne Receiver
TUBES (Five)	Types 12BE6 Conv., 12BA6 IF Amp., 12AV6 Det.-AVC-AF Amp., 50C5 Audio Output, 35W4 Rectifier
POWER SUPPLY	110-120 Volts AC-DC RATING .24 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	535-1630KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer, turn tuning capacitor fully closed and set pointer to last reference mark at low frequency end of dial. Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 7 (grid) of 12BE6 (V1). Low side to B-.	455KC (400%Mod)	Tuning gang fully open	Across voice coil	A1, A2	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.		Loop	1630KC	"	"	A3	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		"	1400KC	Tune to 1400KC signal	"	A4	"

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PARTS LIST AND DESCRIPTIONS

ROLAND
MODEL 5T4

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA		RETMA BASE TYPE	NOTES
		ROLAND PART No.	STANDARD REPLACEMENT		
V1	Converter	12BE6	12BE6	7CH	
V2	IF Amplifier	12BA6	12BA6	7BK	
V3	Det-AVC-AF Amp.	12AV6	12AV6	7BT	
V4	Audio Output	50C5	50C5	7CV	
V5	Rectifier	35W4	35W4	5BQ	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	ROLAND PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	40	150		PRS150/50-30-20		BBRT44215		3N532	TVA-3448	Red
B	40	150								Blue
C	20	150								Yellow
C2	.05	400		P488-05	DF-503	CUB4S5		PT415	4TM-S5	
C3	270			SI270	D6-271	TP41	GP2K-271	UC-5327	5GA-T27	
C4	270			SI270	D6-271	TP41	GP2K-271	UC-5327	5GA-T27	
C5	.01	600		P688-01	D6-103	CUB6S1	GP2-333-103	PT611	6TM-S1	
C6	270			SI270	D6-271	TP47	GP2K-271	UC-5327	5GA-T27	
C7	.01	600		P688-01	D6-103	CUB6S1	GP2-333-103	PT611	6TM-S1	
C8	.01	600		P688-01	D6-103	CUB6S1	GP2-333-103	PT611	6TM-S1	
C9	.01	600		P688-01	D6-103	CUB6S1	GP2-333-103	PT611	6TM-S1	
C10	.1	400		P488-1	DF-104	CUB4P1		PT401	4TM-S1	

CONTROLS

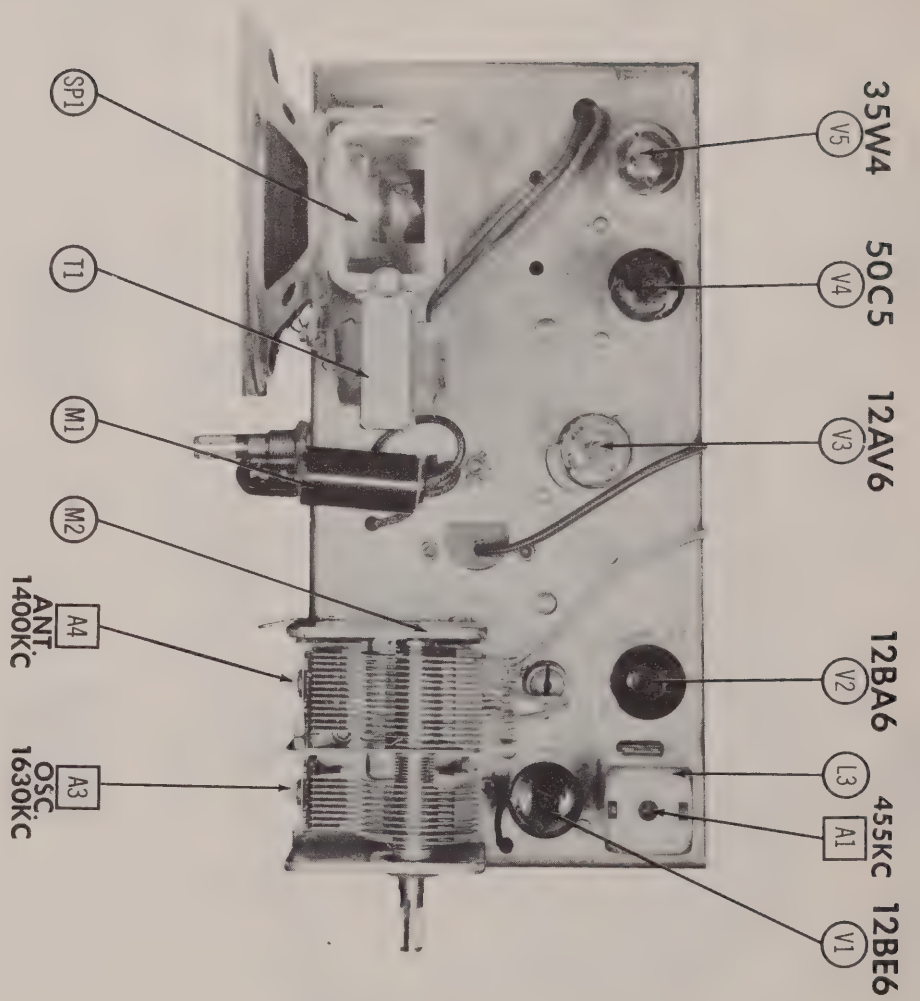
ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	ROLAND PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1A	500KΩ	½	VC-51	Q13-133	A47-500K-Z	BSK-60-S	U-48	Volume
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Not Req.	Attach to R1A
C	Switch		Not Req.	76-1	SWE-12	Not Req.	US-26	Attach to R1A

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	ROLAND PART No.	IRC PART No.	
R2	22KΩ	½		BTS-22K	
R3	4700Ω	½		BTS-4700	
R4	68KΩ	½		BTS-68K	
R5	2.2Meg	½		BTS-2.2Meg	
R6	4.7Meg	½		BTS-4.7Meg	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	ROLAND PART No.	IRC PART No.	
R7	220KΩ	½		BTS-220K	
R8	470KΩ	½		BTS-470K	
R9	150Ω	1			
R10	1500Ω	1		BTA-1500	
R11	18Ω	½		BTS-18	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	ROLAND PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.	
T1	2.16KΩ	3.3Ω	P-70-D	A-3332①	A-3025 ①	S-2X ①	Z1101①	TS-24S50 ①	① Bend mounting tabs down, file out slots, mount on original mounting bracket.

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	ROLAND PART No.	VIKING PART No.	QUAM PART No.	
SP1	3½"	PM	3.3Ω	SP-31	35J4	3A07	

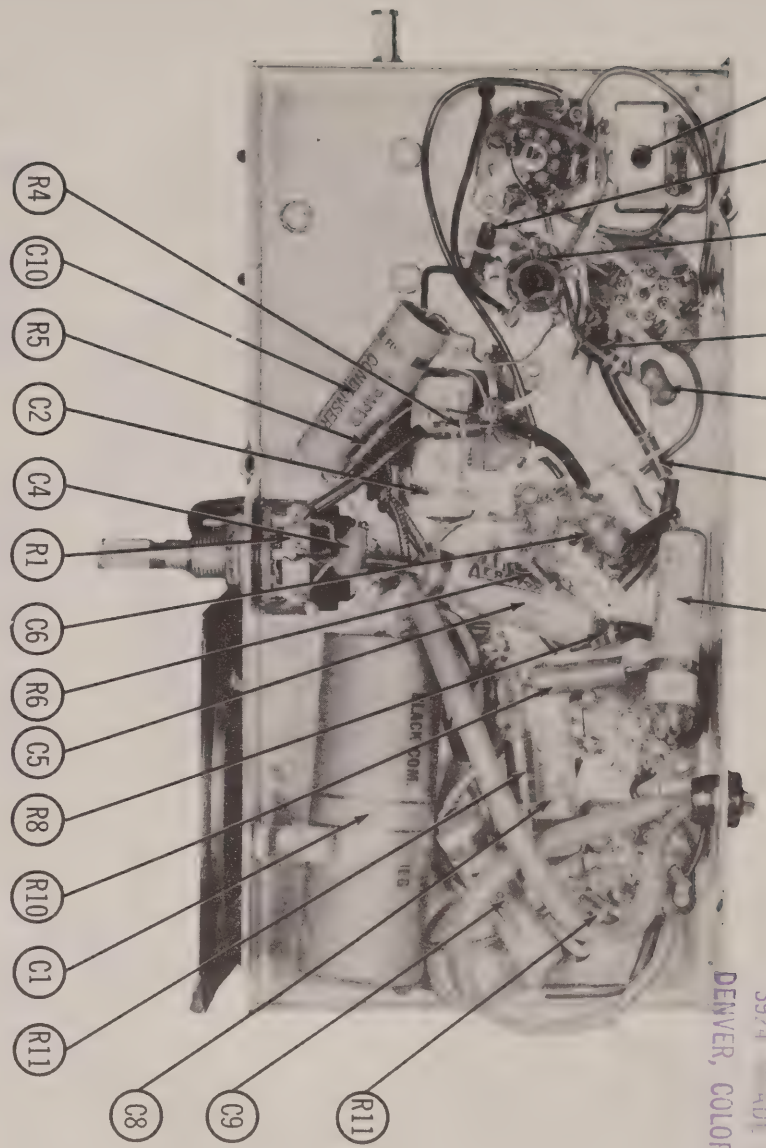
COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	ROLAND PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Loop Ant.	3Ω		LP514				
L2	Osc. Coil	.6Ω	6Ω		14-1073		69-Osc.	
L3	IF Trans.	20Ω	20Ω	LF-24	16-6758	BC-353	12-C2	

MISCELLANEOUS

ITEM No.	PART NAME	ROLAND PART No.	NOTES
M1	Dial light		# 47 bayonet
M2	Tuning cap	CV-62	2 section (43-462MMF)(27-195MMF)

CHASSIS—BOTTOM VIEW



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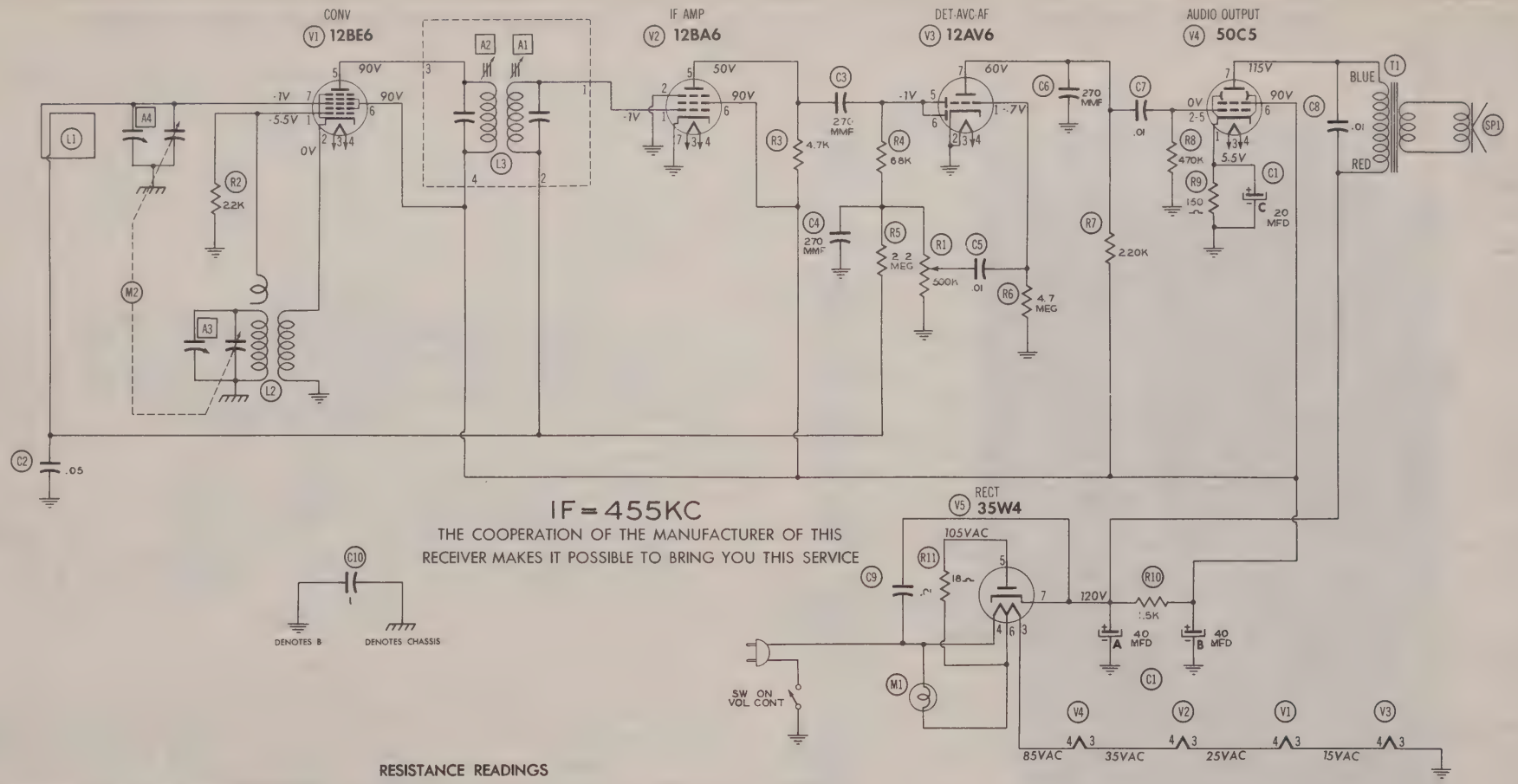
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

ROLAND
MODEL 5T4

ROLAND
MODEL 5T4



RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	12BE6	22KΩ	.6Ω	14Ω	27Ω	†1.5KΩ	†1.5KΩ	2.7Meg
V 2	12BA6	2.7Meg	0Ω	27Ω	39Ω	†6.2KΩ	†1.5KΩ	0Ω
V 3	12AV6	4.7Meg	0Ω	0Ω	14Ω	570KΩ	570KΩ	†220KΩ
V 4	50C5	150Ω	470KΩ	39Ω	88Ω	470KΩ	†1.5KΩ	†170Ω
V 5	35W4	INF	INF	88Ω	120Ω	130Ω	115Ω	100KΩ

† MEASURED FROM PIN 7 OF V5

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

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PROPERTY OF
L. F. BLANKENEY
3924 MINOT ST.
DENVER, COLORADO

STEELMAN
MODEL 3RP3

TRADE NAME	Steelman Model 3RP3
MANUFACTURER	Steelman Phono & Radio Co., Inc., 12-30 Anderson Ave., Mt. Vernon, N.Y.
TYPE SET	AC Operated AM Superheterodyne Receiver with 3 Speed Manual Record Player
TUBES (Five)	Types 12BE6 Conv., 12BA6 IF Amp., 12AT6 Det.-AVC-AF Amp., 50C5 Audio Output, 35W4 Rectifier
POWER SUPPLY	110-120 Volts AC-60 Cycle RATING .19 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	535-1620KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer, turn tuning capacitor fully closed and set pointer to last reference mark at low frequency end of dial. Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 7 (grid) of 12BE6 (V1). Low side to B-.	455KC (400~Mod)	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.		Loop	1620KC	"	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		"	1400KC	Tune to 1400KC signal	"	A6	"

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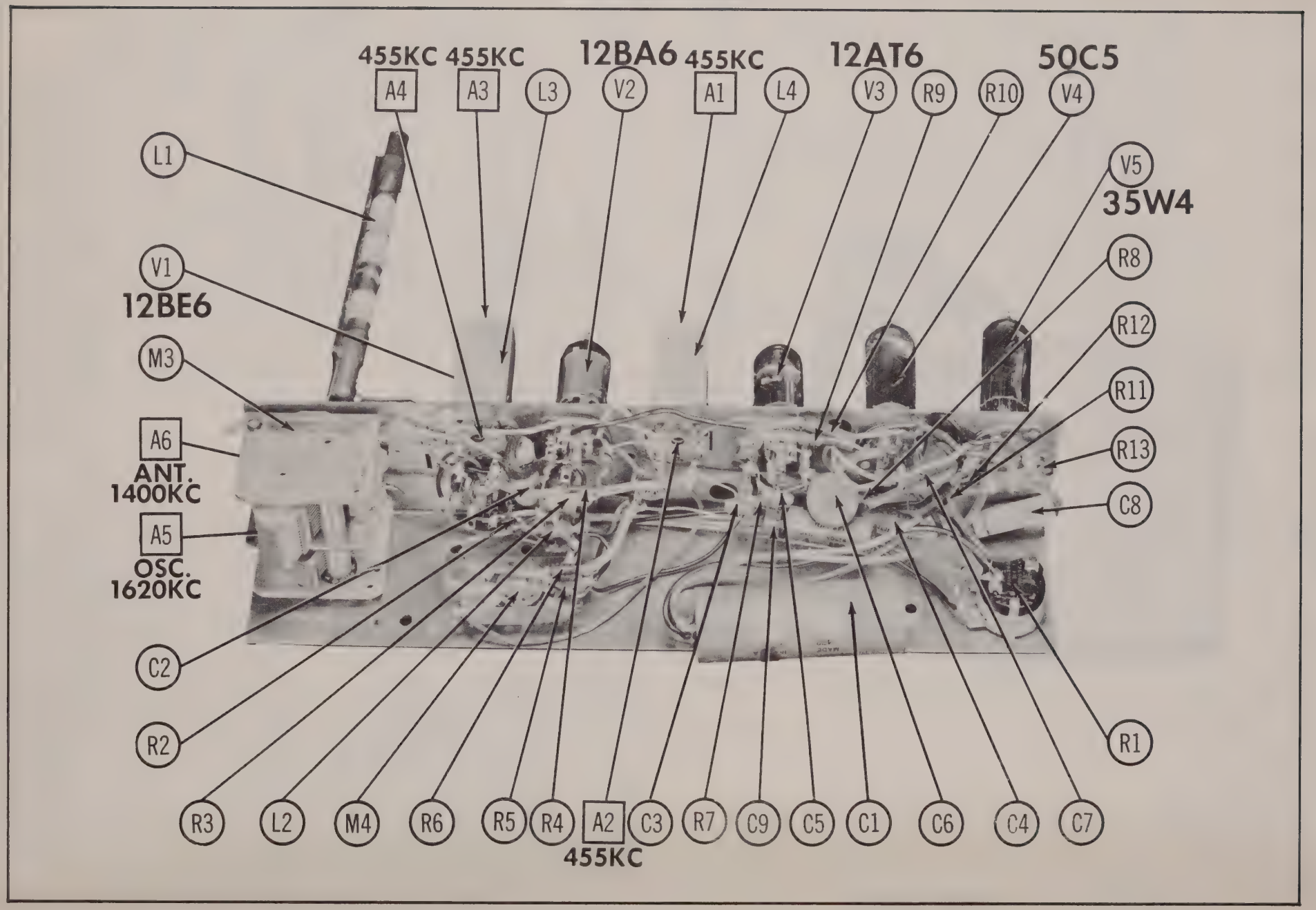
STEELMAN
MODEL 3RP3



PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA		RETMA BASE TYPE	NOTES
		STEELMAN PART No.	STANDARD REPLACEMENT		
V1	Converter	12BE6	12BE6	7CH	
V2	IF Amplifier	12BA6	12BA6	7BK	
V3	Det-AF-Amplifier	12AT6	12AT6	7BT	
V4	Output	50C5	50C5	7CV	
V5	Rectifier	35W4	35W4	5BQ	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	STEELMAN PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	40	150		PRS150/50-30		EDL-44215		3N532	TVA-3448	Red
B	40	150		-20						Red
C	20	150								Blue
C2	.05	200		P288-05	DF-503	PJ2S5		PT415	2TM-S5	
C3	270			SI270	D6-271	TP41	GP1K-271	UC-5327	5GA-T27	
C4	.01	600		P688-01	D6-103	CUB6S1	GP2-333-103	PT611	6TM-S1	
C5	270			SI270	D6-271	TP41	GP1K-271	UC-5327	5GA-T27	
C6	10000			BPD-01	DD-103	K080	811-01	DC-511	5HK-S1	
C7	10000			BPD-01	DD-103	K080	811-01	DC-511	5HK-S1	
C8	.01	600		689ZX-01		PJ6S1		PT611	6TM-S1	
C9	.1	400		489ZX-01		PJ4S1		PT411	4TM-S1	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	STEELMAN PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1A	1 Meg	½	VC-42	Q13-137	AG-63-Z	BSK-70-S	U-53	Volume
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Not Req.	Attach to R1A
C	Switch		Not Req.	76-1	SWB	Not Req.	US-26	Attach to R1A

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	STEELMAN PART No.	IRC PART No.	
R2	22KΩ	½		BTS-22K	
R3	220Ω	½		BTS-220	
R4	2.2Meg	½		BTS-2.2Meg	
R5	220KΩ	½		BTS-220K	
R6	2.2Meg	½		BTS-2.2Meg	
R7	4.7Meg	½		BTS-4.7Meg	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	STEELMAN PART No.	IRC PART No.	
R8	220KΩ	½		BTS-220K	
R9	470KΩ	½		BTS-470K	
R10	150Ω	1		BTA-150	
R11	2200Ω	1		BTA-2200	
R12	330Ω	1		BTA-330	
R13	15Ω	½		BTS-15	

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	STEELMAN PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.	
T1	2.3KΩ	3.1Ω		A-3332	A-3025	S-1X ①	Z1101	TS-24S50①	① Drill one new mounting hole.

SET 238

FOLDER 13

STEELMAN MODEL 3RP3

PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	STEELMAN PART No.	JENSEN PART No.	QUAM PART No.	
SP1	4"	PM	3.1Ω		ST-113 Mod P4-X	4A07	

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	STEELMAN PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Ant. Coil	.4Ω		LPFE-14				
L2	Osc. Coil	.6Ω	5.5Ω		14-1073		69-Osc.	
L3	Input IF	20Ω	20Ω	LF-50	16-6758	BC-352	12-C1	
L4	Output IF	20Ω	20Ω	LF-50	16-6758	BC-353	12-C2	

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA							REMARKS
	STEELMAN PART No.	ASTATIC PART No.		SHURE PART No.		ELECTRO-VOICE PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	
M1		LQD-1J	"Q" & Q-33			96-0	0-1 & 0-3	* Complete tone arm and cartridge assembly
		*7-D				*2600		

ASTATIC AND ELECTRO-VOICE NEEDLE LISTINGS SHOWN ABOVE ARE SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGES LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENT SEE BELOW.

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA			REMARKS
	STEELMAN PART No.	WALCO PART No.	JENSEN PART No.	
M2		W-2A or W-2S & W-2MGA or W-2MGS	A-80 or A-81 & A-80LP or A-81LP	

MISCELLANEOUS

ITEM No.	PART NAME	STEELMAN PART No.	NOTES
M3	Tuning cap	CV62	2 section (43-462MMF, 27-195MMF)
M4	Switch		Function

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L. F. BLANKEN
3944 MEADE ST.
DENVER, COLORADO

PROPERTY OF
L. F. BLANKENSHIP
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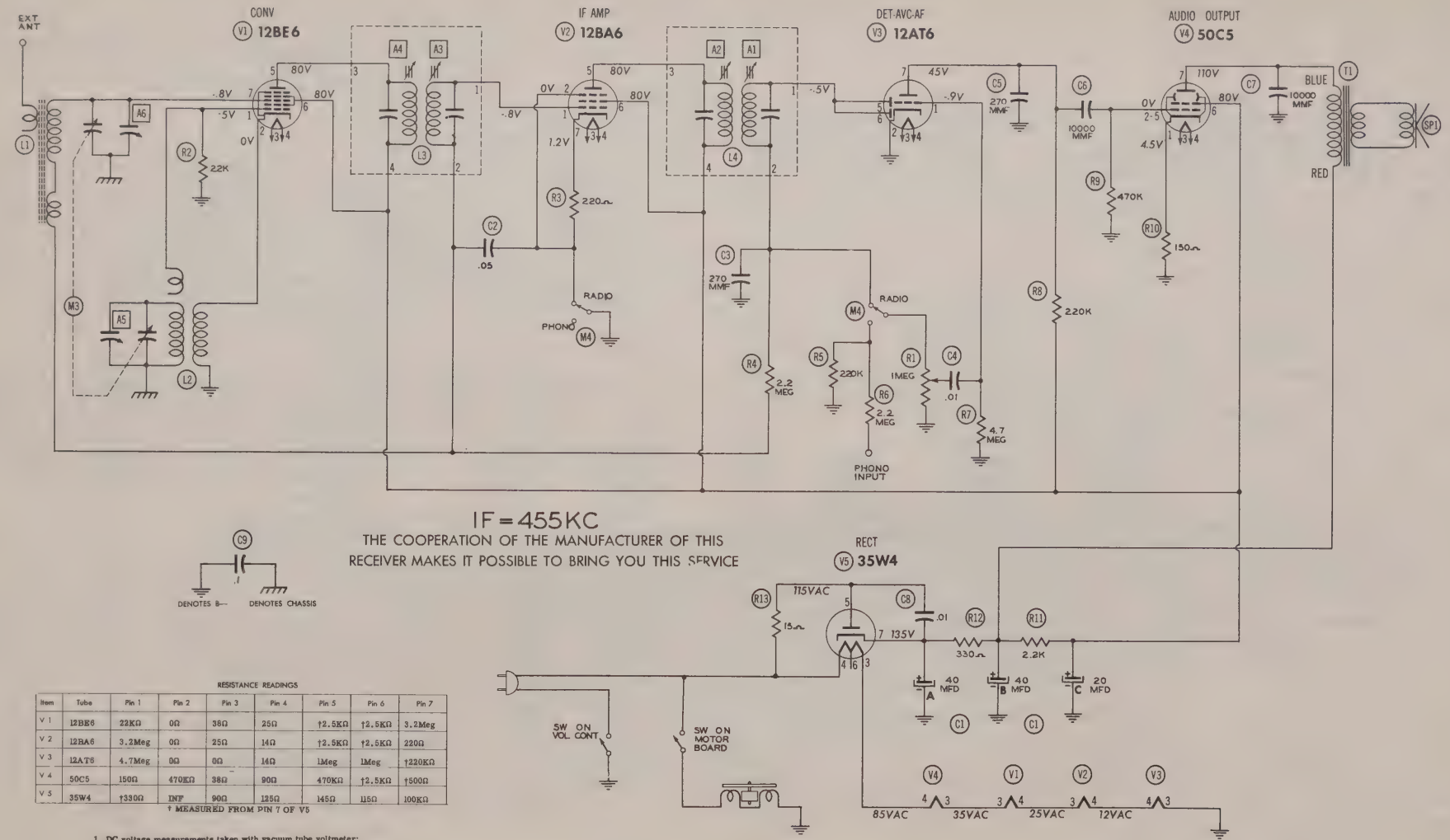
DENVER, COLORADO

STEELMAN MODEL 3RP3



IF = 455KC

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	12BE6	22KΩ	0Ω	38Ω	25Ω	†2.5KΩ	†2.5KΩ	3.2Meg
V 2	12BA6	3.2Meg	0Ω	25Ω	14Ω	†2.5KΩ	†2.5KΩ	220Ω
V 3	12AT6	4.7Meg	0Ω	0Ω	14Ω	1Meg	1Meg	†220KΩ
V 4	50C5	150Ω	470KΩ	38Ω	90Ω	470KΩ	†2.5KΩ	†500Ω
V 5	35W4	†330Ω	INF	90Ω	125Ω	145Ω	115Ω	100KΩ

† MEASURED FROM PIN 7 OF V5

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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MODEL 2D1336A

TRUETONE
MODEL 2D1336A

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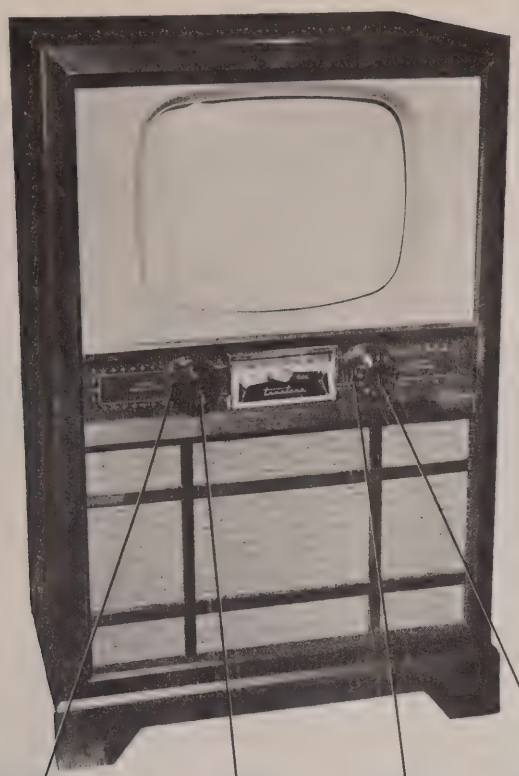

TRUETONE
MODEL 2D1336A

TRADE NAME	Truetone Model 2D1336A
SUPPLIER	Western Auto Supply Co., 2107 Grand Ave., Kansas City, Mo.
TYPE SET	Television Receiver
TUBES	Twenty-five
POWER SUPPLY	110-120 Volts AC-60 Cycle RATING 1.8 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 26.2MC, Sound IF 21.7MC (Intercarrier)

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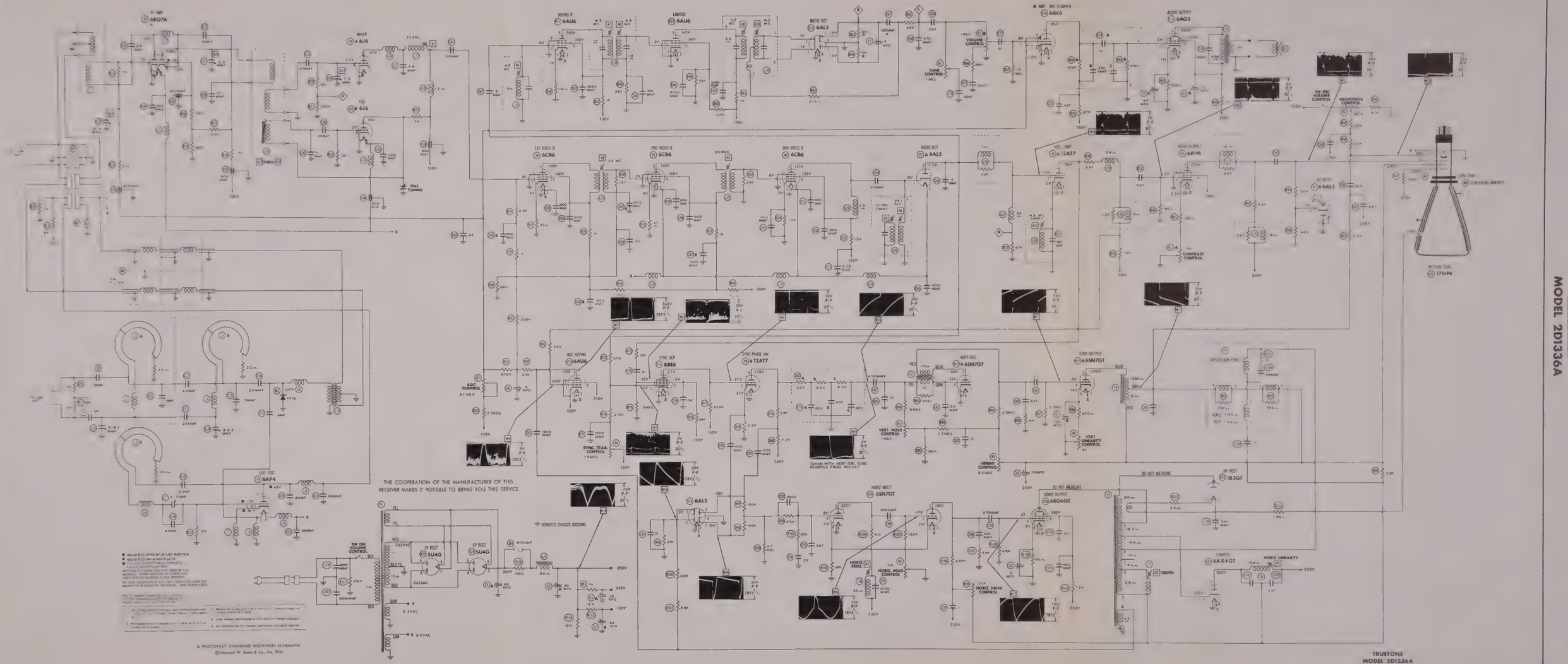
TRUETONE
MODEL 2D1336A
THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE
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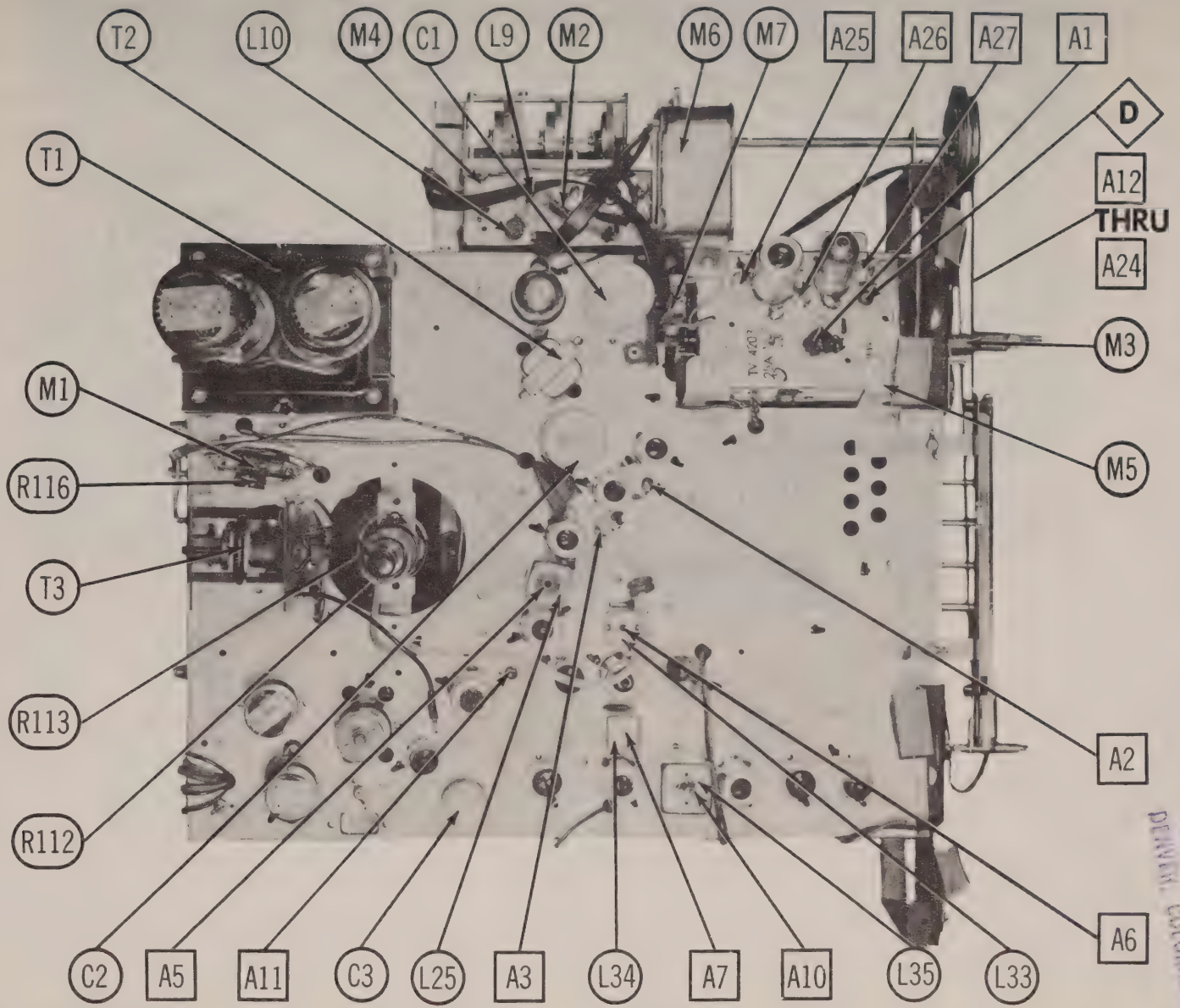
MODEL 2D1336A



For tube location see tube placement chart page 5.

CHASSIS TOP VIEW

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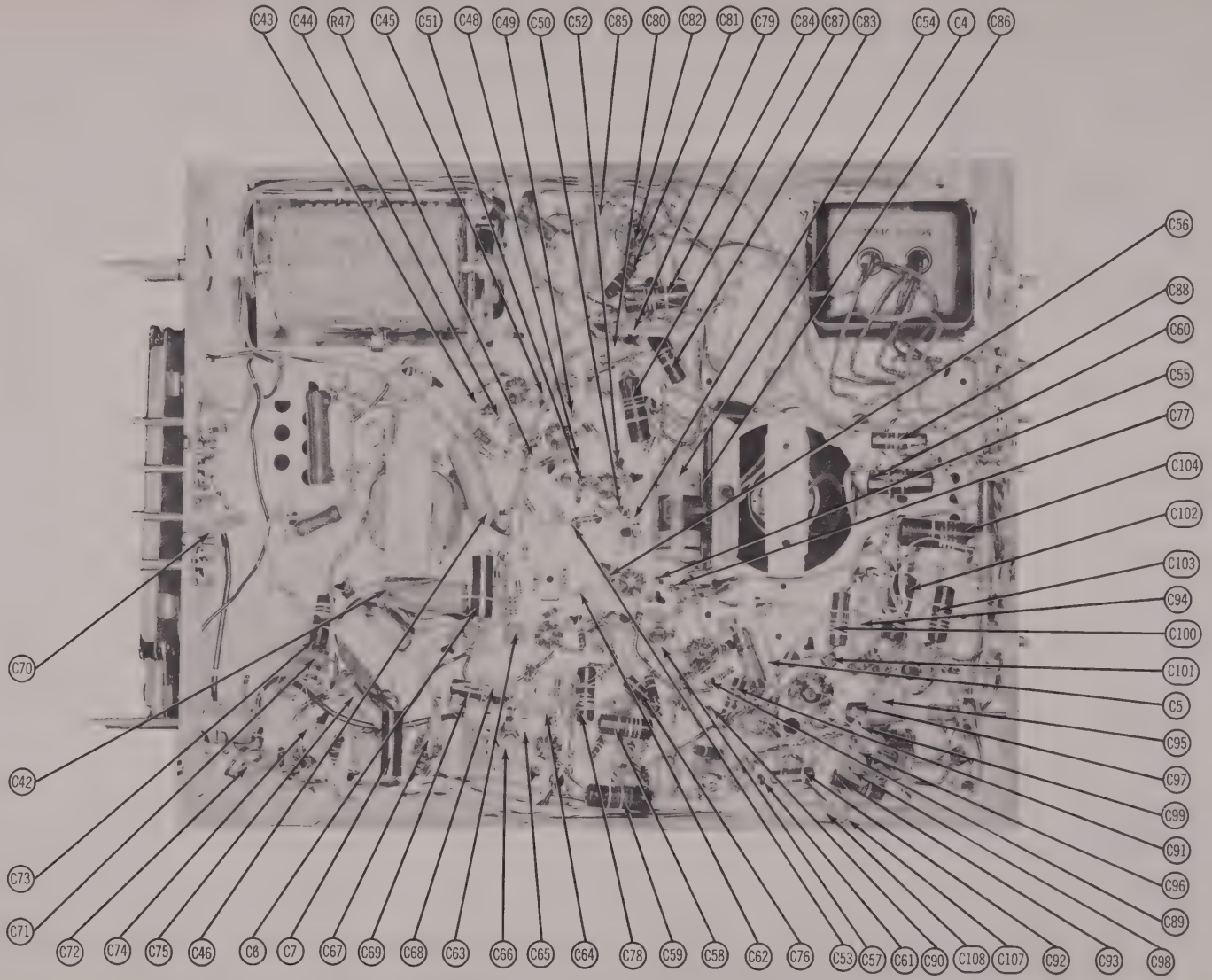

CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION

TUBE PLACEMENT CHART

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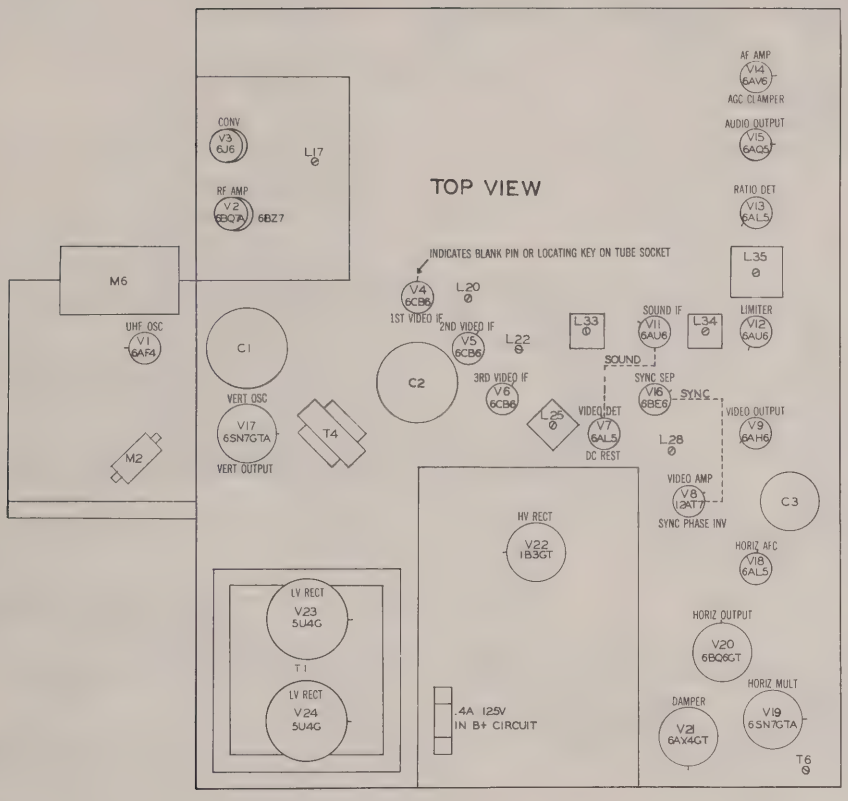


TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - V23, V24, Fuse (M1)

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - V3, V4, V5, V6, V7, (V1 UHF only)
No pic, no sound, has snow - V2, V3, V4
No pic, has sound, has raster - V8, V9, V25
Has pic, no sound - V11, V12, V13, V14, V15
Overloaded picture - V10, V14

SYNC FAILURE
No vert. sync - V8, V17
No horiz. sync - V8, V18, V19
No vert. or horiz. sync - V8, V16

SWEEP FAILURE
No raster, has sound - V19, V20, V21, V22, V25
No vertical deflection - V17
Poor vert. linearity or foldover - V17
Poor horiz. linearity or foldover - V19, V20, V21
Narrow picture - V19, V20, V21, V22, V23, V24
Vert. off freq. - V8, V17
Horiz. off freq. - V8, V18, V19

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage shock hazard may be eliminated by removing the horizontal oscillator tube, V19.

VIDEO IF ALIGNMENT

Remove the converter tube (V3) from its socket and replace with a 6J6 which has Pin 1 removed. This will disable the local oscillator and reduce the possibility of erroneous indications.
Connect the negative lead of a 4.5 volt bias supply to the ungrounded side of C46. Connect the positive lead to chassis.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to an ungrounded tube shield floating over dummy converter tube. Low side to chassis.	25.2MC (Unmod)	Any	DC probe to point (A). Common to chassis.	A1	Adjust for maximum deflection.
2.	"	"	23.1MC	"	"	A2	"
3.	"	"	25.9MC	"	"	A3	"
4.	"	"	24.1MC	"	"	A4	"
5.	"	"	21.7MC	"	"	A5	Adjust for MINIMUM deflection.

OVERALL VIDEO IF RESPONSE CHECK

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
6.	Direct	High side to an ungrounded tube shield floating over dummy converter tube. Low side to chassis.	24MC (10MC Swp)	21.7MC 23.0MC 23.5MC 25.25MC 26.2MC	Any	Vert. Amp. thru 22KΩ to point (A). Low side to chassis.		Check for response curve similar to Fig.1. If necessary, retouch A1 thru A4 for desired response.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
7.	.01MFD	High side to pin 7 (plate) of 6AL5 (V7). Low side to chassis.	4.5MC (Unmod.)	Any	DC probe to point (B). Common to chassis.	A6, A7, A8, A9	Adjust for maximum deflection.
8.	"	"	"	"	DC probe to point (C). Common to chassis.	A10	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
7.	.01MFD	High side to pin 7 (plate) of 6AL5 (V7). Low side to chassis.	4.5MC (450KC Swp)	4.5MC	Any	Vert. Amp. thru 22KΩ to point (B). Low side to chassis.	A6, A7, A8, A9	Disconnect stabilizer capacitor C7. Adjust for curve of maximum amplitude and symmetry as in Fig.2.
8.	"	"	"	"	"	Vert. Amp. thru 22KΩ to point (C). Low side to chassis.	A10	Reconnect stabilizer capacitor C7. Adjust so that 4.5MC occurs at center of crossover lines as in Fig. 3. SLIGHTLY retouch A9 for maximum amplitude and straightness of crossover lines.

4.5MC TRAP ALIGNMENT

Turn contrast control to maximum clockwise position. An alternate method of aligning the 4.5MC trap is to tune in a TV station and adjust A11. for minimum 4.5MC beat interference in the picture.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
9.	10KΩ Resistor	High side thru 10KΩ to pin 7 (plate) of 6AL5 (V7). Low side to chassis.	Not used	4.5MC (400∿Mod)	Any	Vert. Amp. thru 22KΩ to pin 2 of picture tube. Low side to chassis.	A11	Adjust for MINIMUM 400∿ indication on scope.

OSCILLATOR ALIGNMENT

Remove the dummy converter tube and place the original 6J6 in its socket.
The oscillator adjustment screws for each channel are reached through a hole just to the right of the channel switch shaft. The correct adjustment screw is accessible through this hole as the channel switch is turned to each channel. Leave bias connected as under video IF alignment.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
10.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	211.25MC 215.75MC	13	Vert. Amp. thru 22KΩ to point (A). Low side to chassis.	A12	Adjust to place sound marker in trap notch as in Fig. 4. Video marker should be at 50%.
			207MC (10MC Swp)	205.25MC 209.75MC	12		A13	
			201MC (10MC Swp)	199.25MC 203.75MC	11		A14	
			195MC (10MC Swp)	193.25MC 197.75MC	10		A15	
			189MC (10MC Swp)	187.25MC 191.75MC	9		A16	
			183MC (10MC Swp)	181.25MC 185.75MC	8		A17	
			177MC (10MC Swp)	175.25MC 179.75MC	7		A18	
			85MC (10MC Swp)	83.25MC 87.75MC	6		A19	
			79MC (10MC Swp)	77.25MC 81.75MC	5		A20	
			69MC (10MC Swp)	67.25MC 71.75MC	4		A21	
			63MC (10MC Swp)	61.25MC 65.75MC	3		A22	
			57MC (10MC Swp)	55.25MC 59.75MC	2		A23	
			124MC (10MC Swp)	122.25MC 126.75MC	UHF		A24	

DENVER, COLORADO

ALIGNMENT INSTRUCTIONS (cont)

RF AND MIXER ALIGNMENT

Connect the negative lead of a 1.5 volt battery to the tuner AGC terminal. Connect the positive lead to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
11.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	207MC (10MC Swp)	205.25MC 209.75MC	12	Vert. Amp. thru 22KΩ to point (D). Low side to chassis.	A25,A26 A27	Adjust for response curve similar to Fig. 5 with markers above 90%.
12.	"	"	213MC (10MC Swp)	211.25MC 215.75MC	13	"		Check for response similar to Fig.5. If markers fall below 70% on any channel make SLIGHT compromise adjustments of A25, A26 and A27 with channel switch set to that channel. Recheck all other channels to see that they have not been seriously affected.
			201MC (10MC Swp)	199.25MC 203.75MC	11			
			195MC (10MC Swp)	193.25MC 197.75MC	10			
			189MC (10MC Swp)	187.25MC 191.75MC	9			
			183MC (10MC Swp)	181.25MC 185.75MC	8			
			177MC (10MC Swp)	175.25MC 179.75MC	7			
			85MC (10MC Swp)	83.25MC 87.75MC	6			
			79MC (10MC Swp)	77.25MC 81.75MC	5			
			69MC (10MC Swp)	67.25MC 71.75MC	4			
			63MC (10MC Swp)	61.25MC 65.75MC	3			
			57MC (10MC Swp)	55.25MC 59.75MC	2			

UHF TUNER ALIGNMENT

Alignment of this portion of the receiver is not recommended in the field due to circuit complexity. If the UHF tuner fails to operate satisfactorily after tube or crystal replacement, disconnect the tuner and return it to the factory for repair.

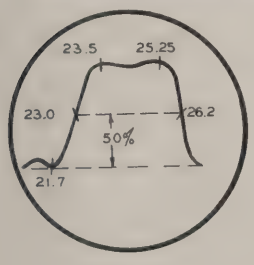


FIG.1

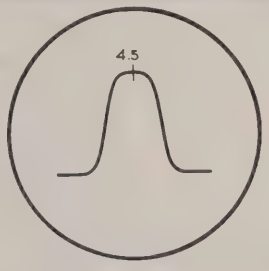


FIG.2

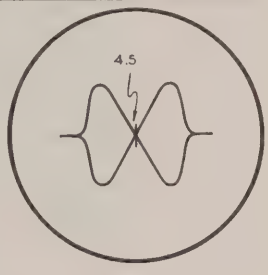


FIG.3

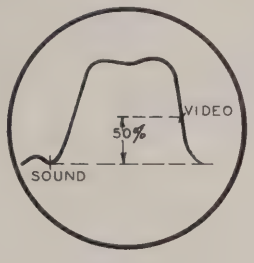


FIG.4

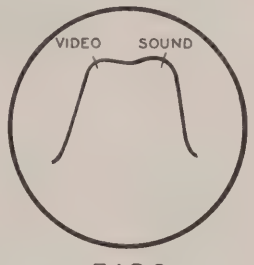
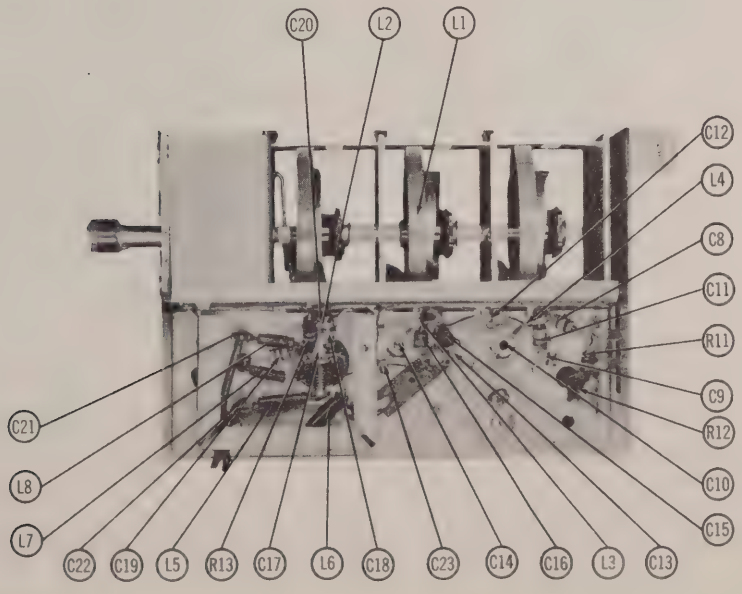


FIG.5



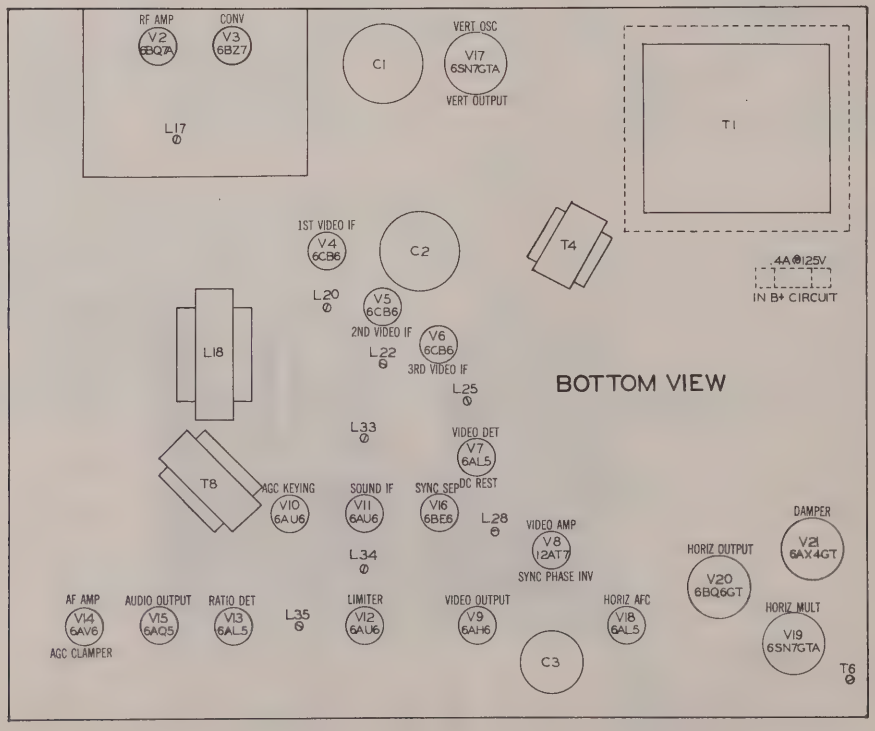
UHF TUNER

TRUETONE MODEL 2D1336A

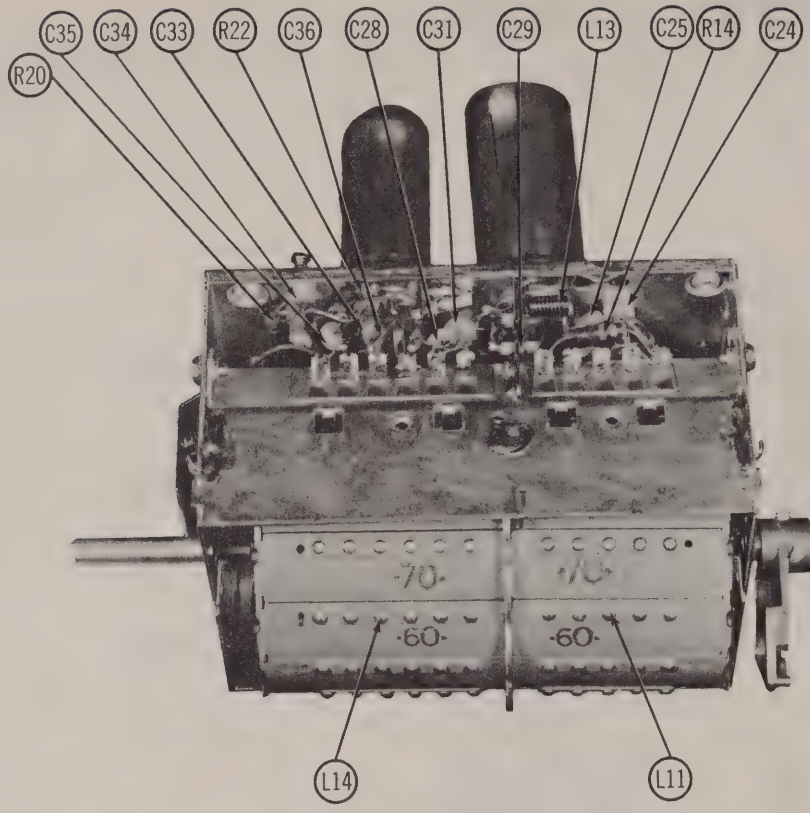
RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6AF4	†■6KΩ	12KΩ	0Ω	.1Ω	0Ω	12KΩ	†■6KΩ		
V 2	6BQ7A	INF	950KΩ	0Ω	.1Ω	0Ω	†1.5KΩ	160KΩ	INF	0Ω
V 3	6J6	†17KΩ	†1.5KΩ	.1Ω	0Ω	230KΩ	10KΩ	0Ω		
V 4	6CB6	110KΩ	47Ω	.1Ω	0Ω	†2.8KΩ	†2.8KΩ	0Ω		
V 5	6CB6	100KΩ	47Ω	.1Ω	0Ω	†2.7KΩ	†2.7KΩ	0Ω		
V 6	6CB6	.3Ω	180Ω	.1Ω	0Ω	†3KΩ	†3KΩ	0Ω		
V 7	6AL5	.3Ω	0Ω	.1Ω	0Ω	1Meg	0Ω	4.7KΩ		
V 8	12AT7	†8.5KΩ	4.7KΩ	.3Ω	0Ω	0Ω	†6.5KΩ	†820KΩ	2.2KΩ	.1Ω
V 9	6AH6	1Meg	0Ω	.1Ω	0Ω	†5KΩ	†1.5KΩ	650Ω		
V 10	6AU6	†36KΩ	†1.5KΩ	.1Ω	0Ω	480KΩ	†45Ω	†1.5KΩ		
V 11	6AU6	1.6Ω	0Ω	.1Ω	0Ω	†2.5KΩ	†2.5KΩ	100Ω		
V 12	6AU6	56KΩ	0Ω	.1Ω	0Ω	†2.5KΩ	†20KΩ	0Ω		
V 13	6AL5	INF	INF	0Ω	.1Ω	10KΩ	0Ω	10KΩ		
V 14	6AV6	10Meg	0Ω	.1Ω	0Ω	900KΩ	900KΩ	†520KΩ		
V 15	6AQ5	470KΩ	330Ω	0Ω	.1Ω	†115KΩ	†1KΩ	470KΩ		
V 16	6BE6	50KΩ	0Ω	.1Ω	0Ω	†820KΩ	†70KΩ	1.5Meg		
V 17	6SN7GT	2.5Meg	♦3.3Meg	0Ω	2.2Meg	♦7.5KΩ	2.2KΩ	.1Ω	0Ω	
V 18	6AL5	4.8Meg	4.8Meg	.1Ω	0Ω	10KΩ	INF	10KΩ		
V 19	6SN7GT	170KΩ	♦300KΩ	1.8KΩ	5.2Meg	†5.2KΩ	1.8KΩ	.1Ω	0Ω	
V 20	6BQ6GT	6.8KΩ	0Ω	INF	†7.5KΩ	470KΩ	♦80KΩ	.1Ω	100Ω	TOP CAP ♦18Ω
V 21	6AX4GT	†45Ω	INF	2.5Meg	5.2Meg	†60Ω	†45Ω	0Ω	.1Ω	
V 22	1B3GT	PINS 1 - 8 HAVE INF RESISTANCE								TOP CAP ♦333Ω
V 23	5U4G	INF	6.5KΩ	INF	13Ω	INF	13Ω	INF	6.5KΩ	
V 24	5U4G	INF	6.5KΩ	INF	13Ω	INF	13Ω	INF	6.5KΩ	
V 25	17HP4	0Ω	1.1Meg	PIN 6 †100KΩ	PIN 10 ♦3.3KΩ	PIN 11 †270KΩ	PIN 12 .1Ω			

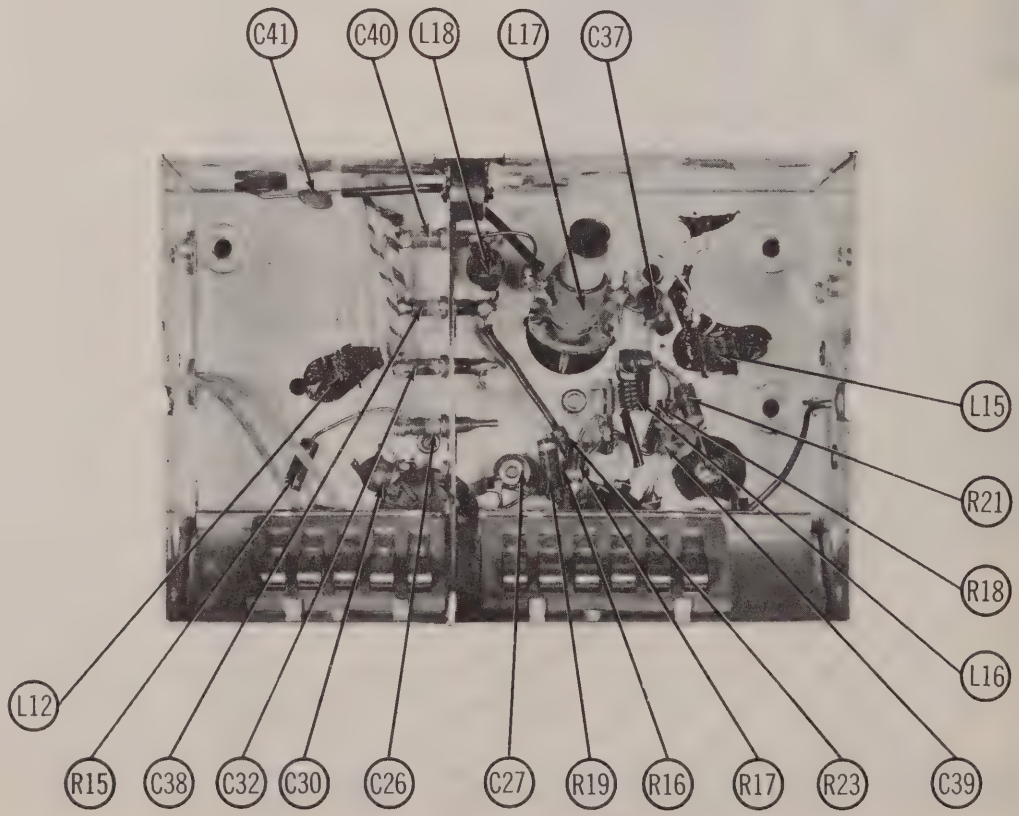
■ MEASURED IN UHF POSITION
♦ MEASURED FROM PIN 3 OF V21
† MEASURED FROM PIN 2 OF V24



TUBE PLACEMENT CHART



VHF TUNER-RIGHT SIDE



VHF TUNER-BOTTOM VIEW

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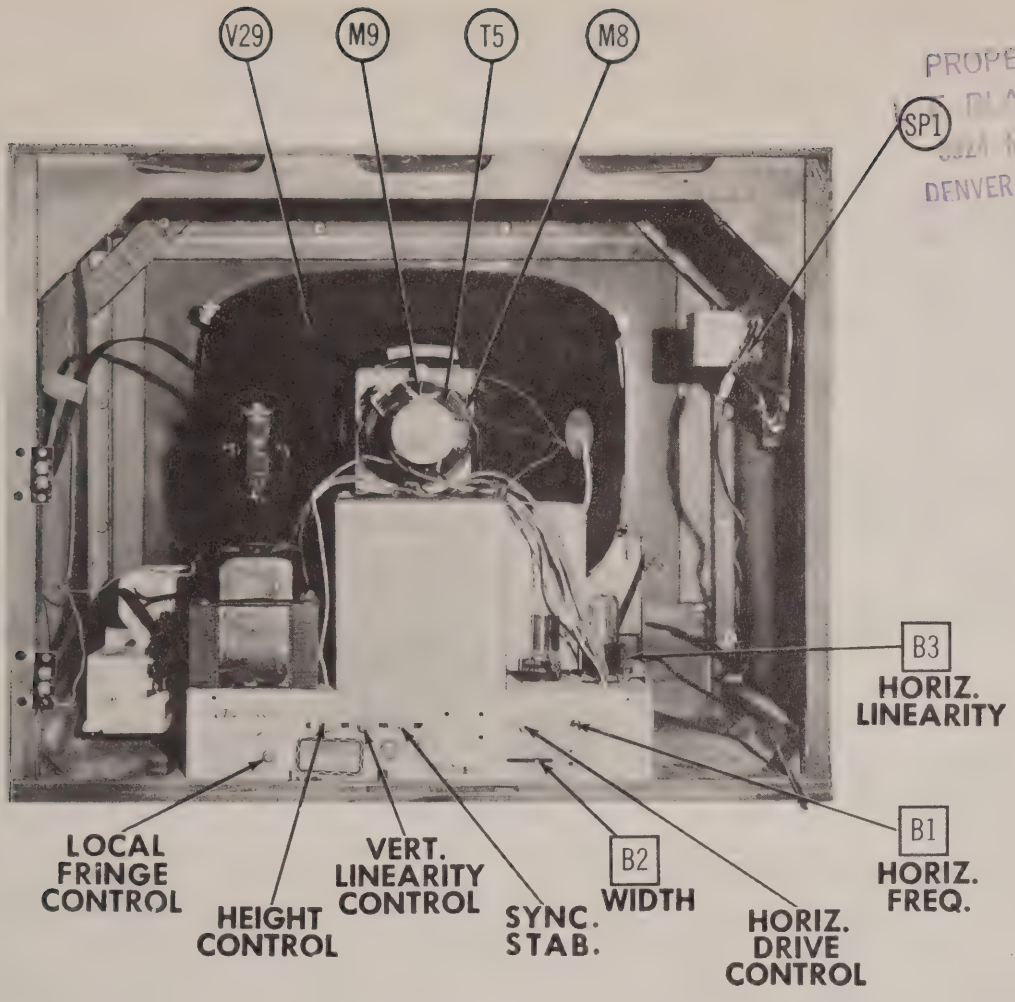


CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.

1. Adjust the horizontal hold control until picture falls into sync. Momentarily remove signal by switching off channel and back again. The picture should pull into sync and remain in sync through 90 degrees rotation of horizontal hold control. If picture does not remain in sync through 90 degrees rotation of horizontal hold control or sync pull in occurs at extreme settings of this control continue with step 2.

2. Set horizontal hold control to it mid-range position and adjust the horizontal frequency slug (B1) until the picture falls into sync. Recheck pull-in range as in step 1.

3. Turn the contrast control fully counter-clockwise. Turn up brightness control until picture appears washed out. Adjust width slug (B2) for a picture slightly wider than necessary to fill picture mask horizontally. Turn the horizontal drive control clockwise as far as possible without the presence of white bars near the center of the picture. Repeat step 1 and if necessary step 2.

4. Adjust the horizontal linearity slug (B3) for a picture that is symmetrical from left to right. If B3 required adjustment then readjustment of the horizontal drive control is necessary.

TROUBLE SHOOTING AIDS

SWEEP

HORIZONTAL

LOSS OF SWEEP

Follow procedure outlined under "Loss of High Voltage".

INSUFFICIENT SWEEP

Check by substitution V19, V20, V21, V23 and V24. Check adjustment of the horizontal drive control, B2 and B3. Check waveform W17.

If Satisfactory	If Unsatisfactory
Check C100, C102, C103, C104, R110, T3, T5A and other associated components.	Check C96, C98, C99, R106, R108, and other associated components.

DRIVE LINES

Check adjustment of the horizontal drive control. Check by substitution V19, V20 and V21. Check C98, C99, R106, R108, C100, C102, C103, C104, T3, T5A and other associated circuit components for failure or change of value.

COMPRESSED LEFT SIDE

Check by substitution V19, V20 and V21. Check adjustment of the horizontal drive control. Check adjustments B2 and B3. Check components associated with the horizontal output and damper stages especially T3 and T5A.

FOLDS

Follow procedure outlined under "Drive Lines".

XMAS TREE EFFECT

Substitute V19. Check L36, C95, C96 and other associated components for failure or change of value.

PIE CRUST EFFECT

Check by substitution V19, V20 and V21. Check T3, T5A, C93 and other associated components.

VERTICAL

LOSS OF SWEEP

Substitute V17. Check waveform W11.

If Satisfactory	If Unsatisfactory
Check T4, T5B and other associated circuit components.	Check C85, R85, R87, T2 and other associated circuit components.

INSUFFICIENT SWEEP

Check adjustment of height and vertical linearity controls. Follow procedure outlined under "Loss of Sweep".

COMPRESSED AT BOTTOM

Substitute V17. Check C2B, T4, T5B and other associated circuit components.

COMPRESSED AT TOP

Substitute V17. Check C84, C85, T2, R85, R87 and other associated components.

FOLDS

Substitute V17. Check associated circuit components especially T2, T4 and T5B for failure or change of value.

SYNC

LOSS OF VERTICAL AND HORIZONTAL SYNC

Check by substitution V16 and V8. Check components associated with V16 and V8B.

LOSS OF VERTICAL SYNC-HORIZONTAL SYNC SATISFACTORY

Check by substitution V8, V16 and V17. Check waveform W9.

If Satisfactory	If Unsatisfactory
Check components associated with V17.	Check vertical integrator network and other associated components.

LOSS OF HORIZONTAL SYNC-VERTICAL SYNC SATISFACTORY

Check by substitution V18 and V19. Check waveform W14.

If Satisfactory	If Unsatisfactory
Check components associated with V19 especially C95 and C96.	Check C89, C90 and other associated components.

HORIZONTAL BENDING

Check by substitution V19 and V20. Check horizontal AFC filter network components (R98, R99, R102, C93, C92, and C94) for failure or change of value.

VIDEO

LOSS OF VIDEO

Check by substitution V8 and V9. Check picture tube and other associated circuit components.

SOUND BARS (4.5MC BEAT)

Check adjustment of tuner fine tuning. Check 4.5MC trap adjustment (A11). Check video IF alignment.

POOR CONTRAST

Check by substitution V7, V8 and V9. Check picture tube and other associated circuit components.

NEGATIVE PIX

Check by substitution V7, V8, V9 and V10. Check AGC network for component failure. Check picture tube and other associated components.

SMEAR

Check by substitution V7, V8 and V9. Check R38, R39, R40, R42, L26, L30, L31, L32, C58, C59, picture tube and other associated circuit components for failure or change of value.

WIDE BLACK BAR ACROSS PIX

Check V2, V3, V4, V5, V6, V7, V8 and V9 for heater to cathode leakage. In case of UHF check V1.

AUDIO

WEAK OR NO SOUND

Check by substitution V11, V12, V13, V14, and V15. Check stages of V14 and V15 using audio signal generator. Apply signal across R67.

If Satisfactory	If Unsatisfactory
Check ratio detector and audio IF alignment and components.	Check components associated with V14 and V15 especially C74.

BUZZ

Adjust tuner fine tuning for best picture and sound. Adjust A10 for minimum buzz. If buzz is still objectionable substitute V13 and realign audio IF and detector stages. Check components associated with V13.

DISTORTED

Follow procedure outlined under "Weak or No Sound".

PROPERTY OF
L. F. BLANKENSHIP
3324 MEADE ST.
DENVER, COLORADO

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA		RETMA BASE TYPE	NOTES
		TRUETONE PART No.	STANDARD REPLACEMENT		
V1	UHF Oscillator	6AF4	6AF4	7DK	
V2A	RF Amplifier	6BQ7A	6BQ7A	9AJ	
B	RF Amplifier	6BZ7	6BZ7	9AJ	
V3	Converter	6J6	6J6	7BF	
V4	1st. Video IF Amp.	6CB6	6CB6	7CM	
V5	2nd. Video IF Amp.	6CB6	6CB6	7CM	
V6	3rd. Video IF Amp.	6CB6	6CB6	7CM	
V7	Video Detector-DC Restorer	6AL5	6AL5	6BT	
V8	Video Amplifier-Sync Phase Inv.	12AT7	12AT7	9A	
V9	Video Output	6AH6	6AH6	7BK	
V10	AGC Keying	6AU6	6AU6	7BK	
V11	Sound IF Amp.	6AU6	6AU6	7BK	
V12	Limiter	6AU6	6AU6	7BK	
V13	Ratio Detector	6AL5	6AL5	6BT	
V14	AF Amplifier-AGC Clamper	6AV6	6AV6	7BT	
V15	Audio Output	6AQ5	6AQ5	7BZ	
V16	Sync Separator	6BE6	6BE6	7CH	
V17	Vert. Oscillator - Vert. Output	6SN7GTA	6SN7GTA	8BD	
V18	Horiz. AFC	6AL5	6AL5	6BT	
V19	Horiz. Mult.	6SN7GTA	6SN7GTA	8BD	
V20	Horiz. Output	6BQ6GT	6BQ6GT	6AM	
V21	Damper	6AX4GT	6AX4GT	4CG	
V22	HV Rectifier	1B3GT	1B3GT	3C	
V23	LV Rectifier	5U4G	5U4G	5T	
V24	LV Rectifier	5U4G	5U4G	5T	

CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA				RETMA BASE TYPE	NOTES
	TRUETONE PART No.	SYLVANIA PART No.	GENERAL ELECTRIC PART No.	WESTINGHOUSE PART No.		
V25	17RP4/17HP4	17RP4/17HP4	17RP4/17HP4	17HP4/17HP4	12C	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	TRUETONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	▲80	300	45X397	AFH3-46		C037		FP378	TVL-2584	
B	▲60	300								
C2A	▲80	300	45X395	AFH3-142		C109		FP375	TVL-3764	
B	▲100	50								
C3A	■20	300	45X399	AFH3-137		C097		FP366	TVL-3682	
B	▲10	300								
C	40	50								
C4	30	400	45X393	PRS450/30		BR3045		TC77	TVA-1711	
C5	5	25	45X378	PRS150/4		BR550		TC30	TVA-1203	
C6	4	100	45X361	PRS150/4		BR415		TC40	TVA-1402	
C7	5	25	45X378	PRS150/4		BR550		TC30	TVA-1203	
C8	1									
C9	1									
C10	.8-6.5									
C11	1									
C12	.42									
C13	.25									
C14	.8-6.5									
C15	1.5									
C16	2.5									
C17	3-10									
C18	4									
C19	15									
C20	2									
C21	68									
C22	68									
C23	1									
C24	3-9		31B-207		829-3					
C25	3.6		CD8C3R6C							
C26	800		13D-153	EF-001	MFT-1000				503C-D1	
C27	.5-3		31B-206		829-3			CT565A		
C28	47		CD8Q470K	BPD-000047	D6-470		GP1K-470	UC-5447	5GA-Q47	
C29	800		13D-196	EF-001	MFT-1000				503C-D1	
C30	1000		CD8X102Z	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C31	1.5		CD8C1R5M	SIL.5NP0	TCZ-1.5		NP0K-1R5	ZT-5515	5TCCB-V15	
C32	800		13D-153	EF-001	MFT-1000				503C-D1	
C33	47		CD8Q470K	BPD-000047	D6-470		GP1K-470	UC-5447	5GA-Q47	
C34	.5-3		31B-206		829-3			CT565A		
C35	5		CD8U050C							
C36	10		CD10C100K	SI10NP0	TCZ-10		NP0K-100	ZT-541	5TCC-Q1	
C37	6.8		CD8C6R8C	SI6.8NP0	TCZ-6.8		NP0K-6R8	ZT-5568	5TCCB-V68	
C38	800		13D-153	EF-001	MFT-1000				503C-D1	
C39	1000		CD8X102Z	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C40	800		13D-153	EF-001	MFT-1000				503C-D1	
C41	120		13D-055	BPD-00012	D6-121	TM5T12	GP2K-121	UC-5312	5GA-T12	
C42	.22	200	RCP10M2224M	P488-22		PTE4P22		PT4025	4TM-P22	
C43A	1000		80X3	BPD-2X001	DD2-102	TM5DD1	822-001	DCD-521	5HK-2D1	
B	1000									
C44	1000		80X1	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C45	1000		80X1	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C46	.22	200	RCP10M2224M	P488-22		PTE4P22		PT4025	2TM-P22	
C47A	1000		80X3	BPD-2X001	DD2-102	TM5DD1	822-001	DCD-521	5HK-2D1	
B	1000									
C48	1000		80X1	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C49	1000		80X1	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C50	1000		80X1	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C51	1000		80X1	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (cont)

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA TRUETONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C52	1000		80XI	BPD-001	DD-103	TMSD1	801-001	DC-521	5HK-D1	
C53	1000		80XI	BPD-001	DD-103	TMSD1	801-001	DC-521	5HK-D1	
C54	47		47X503	5I47	D5-470		GP1K-470	UC-5347	5GA-Q47	
C55	1000		80XI	BPD-001	DD-103	TMSD1	801-001	DC-521	5HK-D1	
C56	5		47X563	5I5NP0	TCE-4.7		NP0K-050	ET-555	5TCCB-V47	
C57	360	500	47X568							
C58	.047	400	RCP10M4473M	P488-047	DF-503	PTE4S47		PT4147	4TM-S47	
C59	.1	400	RCP10M4104M	P488-1	DF-104	PTE4P1		PT401	4TM-P1	
C60	.1	400	RCP10M3104M	P488-1	DF-104	PTE4P1		PT401	4TM-P1	
C61	1000		80XI	BPD-001	DD-103	TMSD1	801-001	DC-521	5HK-D1	
C62	1.5		47X584	5II.5NP0	TCE-1.5		NP0K-1R5	ET-5515	5TCCB-V15	
C63	5000		47X507	BPD-006	DD-502	TMSD5	811-005	DC-535	5HK-D5	
C64	100		47X604	5II00	D5-101	TMS71	GP1K-101	UC-531	5GA-T1	
C65	5000		47X507	BPD-006	DD-502	TMSD5	811-006	DC-535	5HK-D5	
C66	5000		47X507	BPD-006	DD-502	TMSD5	811-005	DC-535	5HK-D5	
C67	330	500	47X570	1469-00935		SR5T5				Note 1
C68	470	500	47X325	1469-0005		SR5T5		MCB245	MB-35	
C69	.047	200	RCP10M4473M	P488-047	DF-503	PTE4S47		PT4147	4TM-S47	
C70	.0047	400	RCP10M4472M	P488-0047	D6-472	PTE8D47	GP2-333-472	PT8347	6TM-D47	
C71	.0047	400	RCP10M4472M	P488-0047	D6-472	PTE8D47	GP2-333-472	PT8347	6TM-D47	
C72	.01	400	RCP10M4103M	P488-01	D6-103	PTE4S1	GP2-338-103	PT411	4TM-S1	
C73	.047	400	RCP10M4473M	P488-047	DF-503	PTE4S47		PT4147	4TM-S47	
C74A	.01						.01			
B	250		††6X5	†PA-112-3	†PC-80		†1404-01		†10C1	
C										
C75	.0047	600	RCP10M6472M	P688-0047	D6-472	PTE6D47	GP2-333-472	PT8347	6TM-D47	
C76	.01	400	RCP10M4103M	P488-01	D6-103	PTE4S1	GP2-333-103	PT411	4TM-S1	
C77	1000		80XI	BPD-001	DD-103	TMSD1	801-001	DC-521	5HK-D1	
C78	.047	400	RCP10M4473M	P488-047	DF-503	PTE4S47		PT4147	4TM-S47	
C79A	.002					{PTE6D2		{PT622		
B	.005		†7X7	†PC-110	†PC-100	{PTE6D5	†1406-01	{PT625	†10C1	
C	.005					{PTE6D5		{PT625		
C80	4700	500	47X543	1464-005		DR5D5		MCB465	MB-35	
C81	.01	400	RCP10M4103M	P488-01	D6-103	PTE4S1	GP2-333-103	PT411	4TM-P1	
C82	100		47X604	5II00	D6-101	TMS71	GP1K-101	UC-531	5GA-T1	
C83	.01	600	RCP10M6103M	P688-01	D6-103	PTE6S1	GP2-333-103	PT611	6TM-S1	
C84	.047	600	RCP10M6473M	P688-047	DF-503	PTE6S47		PT6147	6TM-S47	
C85	.1	600	RCP10M6104M	P688-1	DF-104	PTE6P1		PT601	6TM-P1	
C86	.1	600	RCP10M6104M	P688-1	DF-104	PTE6P1		PT601	6TM-P1	
C87	.047	600	RCP10M6473M	P688-047	DF-503	PTE6S47		PT6147	6TM-S47	
C88	.015	600	RCP10M6153M	P688-015						
C89	1000		80XI	BPD-001	DD-102	TMSD1	801-001	DC-521	5HK-D1	
C90	1000		80XI	BPD-001	DD-102	TMSD1	801-001	DC-521	5HK-D1	
C91	.01	400	RCP10M4103M	P488-01	D6-103	PTE4S1	GP2-333-103	PT411	4TM-S1	
C92	.0047	400	RCP10M4472M	P488-0047	D6-472	PTE8D47	GP2-333-472	PT8347	6TM-D47	
C93	.047	200	RCP10M4473M	P488-047	DF-503	PTE4S47		PT4147	4TM-S47	
C94	.22	200	RCP10M2234M	P488-22		PTE4P22		PT4025	4TM-P22	
C95	4700	500	47X543	1464-005		DR5D5		MCB465	MB-35	
C96	430	500	RCM50B431K							
C97	.1	400	RCP10M4104M	P488-1	DF-104	PTE4P1		PT401	4TM-P1	
C98	330	500	47X570	1469-00935						
C99	270	500	RCM25A271K	1469-0008		SR5T3		MCB241	MB-33	
C100	.047	400	RCP10M4473M	P488-047	DF-503	PTE4S47		PT4147	4TM-S47	
C101	1000		80XI	BPD-001	DD-103	TMSD1	801-001	DC-521	5HK-D1	
C102	.1	400	RCP10M4104M	P488-1		PTE4P1		PT401	4TM-P1	
C103	.047	400	RCP10M4473M	P488-047		PTE4S47		PT4147	4TM-S47	
C104	.15	400	RCP10M4154M	P488-15		PTE4P15		PT4015	4TM-P15	
C105	1500	20000	47X560	HV30C	TV3-502	MMC-30T5	413-501	HV30035A	30EK-T5	
C106	56	2000	47X598						30GA-Q56	
C107	10000		47X615	BPD-01	DD-103	TM581	811-01	DC-511	5HK-S1	
C108	10000		47X615	BPD-01	DD-103	TM581	811-01	DC-511	5HK-S1	

Note 1. Models using ratio detector trans. Part #9A2269, use 1000MMF in this application (part #80XI)
* Items C78A, C79B, C79C, R82A, R82B, R82C are combined in one unit.
† Items C74A, C74B, C74C, R68A, R68B are combined in one unit.
When replacing items separately, C74B and C74C should total 250MMF.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA TRUETONE PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1500Ω		78X13A	* QJ-431	RTY-409		UF152R	Contrast (Panel)
B	1 Meg		Not Reg.				UR16T25 †	Volume (Rear) tapped at 170K
C	Switch		Not Reg.				UB-26	Attach to R1B
R2A	50K		40X292A	Q11-123	AG-44-8	AB-31	U-33	Horiz. Hold
B	Shaft		Not Reg.	Not Reg.	KS8-3	AK-4	Not Reg.	Attach to R2A
R3A	1 Meg		40X393A	Q11-137	AG-81-8	AB-69	U-54	Tone
B	Shaft		Not R &	NQ	RS-3/16	AK-4	Not Reg.	Attach to R3A
R4A	500KΩ		40X390D	Q11-133	AG-58-8	AB-59	U-50	Brightness
B	Shaft		Not Reg.	NQ	RS-3/16	AK-4	Not Reg.	Attach to R4A
R5A	1 Meg		40X393E	Q11-137	AG-81-8	AB-69	U-54	Vert. Hold
B	Shaft		Not Reg.	NQ	RS-3/16	AK-4	Not Reg.	Attach to R5A
R6A	2.5Meg		B40X3064	Q11-239	AG-84-8	AB-83	SU-565	Height
B	Shaft		Not Reg.	Not Reg.	FKS-1/4	AK-1	Not Reg.	Attach to R6A
R7A	2.5Meg		B40X364	Q11-239	AG-84-8	AB-83	SU-565	AGC
B	Shaft		Not Reg.	Not Reg.	FKS-1/4	AK-1	Not Reg.	Attach to R7A
R8A	5000Ω		40X365A	Q11-116	AG-37-8	AB-14	SU-20	Vert. Linearity
B	Shaft		Not Reg.	Not Reg.	FKS-1/4	AK-1	Not Reg.	Attach to R8A
R9	7.5Meg		40X363					Horiz. Drive
R10A	150KΩ		B40X33A	Q11-129	AG-52-8	AB-46	U-43	Attach to R10A
B	Shaft		Not Reg.	Not Reg.	FKS-1/4	AK-1	Not Reg.	

† Universal replacement (Mallory exact duplicate Part No. UE2045).
* CONCENTRIKIT EQUIVALENT KIT K-2 BASE ELEMENTS & SHAFTS B17-109 & P1-204 (Panel)
B13-137X & R2-216 (Rear) & SWITCH 78-2.

RESISTORS

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA TRUETONE PART No.	IRC PART No.	NOTES
R11	1500Ω			BTS-1500	
R13	1500Ω			BTS-1500	
R13	12KΩ			BTS-12K	
R14	15KΩ		12A-004	BTS-15K	
R15	47KΩ		12A-039	BTS-47K	
R16	100KΩ		12A-094	BTS-100K	
R17	100KΩ 5%		12A-165	BTS-100K 5%	
R18	160KΩ		12A-167	BTS-160K	
R19	150KΩ		12A-163	BTS-150K	
R20	10KΩ		12A-040	BTS-10K	
R21	220KΩ		12A-041	BTS-220K	
R22	10KΩ		12A-040	BTS-10K	

RESISTORS (cont)

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA TRUETONE PART No.	IRC PART No.	NOTES
R23	10KΩ			BTS-15K	
R24	8000Ω	5	43X379	1 3/4A-8000	
R25	12KΩ	3	D8A123	BTB-12K	
R26	8200Ω 5%		B83823	BTS-8200 5%	
R27	47Ω 5%		B83470	BTS-47 5%	
R28	1000Ω		B85102	BTS-1000	
R29	1000Ω		B85102	BTS-1000	
R30	22KΩ 5%		B83223	BTS-22K 5%	
R31	47Ω 5%		B83470	BTS-47 5%	
R32	1000Ω		B85102	BTS-1000	
R33	22KΩ 5%		B83223	BTS-22K 5%	
R34	180Ω		B8418I	BTS-180	
R35	1500Ω		B84151	BTS-1500	
R36	100KΩ		B85104	BTS-100K	
R37	47000Ω 5%		B83472	BTS-4700 5%	
R38	5600Ω	1	C84562	BTA-5600	
R39	1500Ω		B84152	BTS-1500	
R40	1Meg		B84105	BTS-1Meg	
R41	100Ω		B84101	BTS-100	
R42	33000Ω 5%	1	C83392	BTA-3900 5%	
R43	100KΩ		B85104	BTS-100K	
R44	22KΩ		B84223	BTS-22K	
R45	100KΩ		B85104	BTS-100K	
R46	47KΩ		B85473	BTS-47K	
R47	100KΩ		B85104	BTS-100K	
R48	1Meg		B84105	BTS-1Meg	
R49	33KΩ		B84333	BTS-33K	
R50	47KΩ		B84473	BTS-47K	
R51	470KΩ		B84474	BTS-470K	
R52	330KΩ 5%		B83334	BTS-330K 5%	
R53	2.7Meg		B84275	BTS-2.7Meg	
R54	150Ω		B8415I	BTS-150	
R55	150Ω		B8415I	BTS-150	
R56	100Ω		B8410I	BTS-100	
R57	1000Ω		B85102	BTS-1000	
R58	56KΩ		B84563	BTS-56K	
R59	33KΩ		B84333	BTS-33K	
R60	33KΩ		B84333	BTS-33K	Note 1
R61	1000Ω		B85102	BTS-1000	
R62	270Ω		B84271	BTS-270	
R63	10KΩ 5%			BTS-10K 5%	Note 2
R64	10KΩ 5%			BTS-10K 5%	Note 2
R65	68KΩ		B84683	BTS-68K	
R66	68KΩ		B84683	BTS-68K	
R67	10Meg		B85106	BTS-10Meg	
R68A	470KΩ		† 76X5	BTS-470K	
B	470KΩ	1		BTA-470K	
R69	330Ω	1	C84331	BTA-330	
R70	1000Ω	2	D84102	BTB-1000	

Note 1. Some models may use a 100KΩ resistor in this application.
Note 2. Some models may use a 10KΩ resistor in this application.
† Items R68A, R68B, C74A, C74B, C74C are combined in one unit.
* Items R82A, R82B, R82C, C79A, C79B, C79C are combined in one unit.

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	REPLACEMENT DATA TRUETONE PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	RCA TYPE No.	Halldorson PART No.	Thordorson PART No.
T1	117VAC ⑥1.8A	490VCT .380ADC	5VAC ⑥ 6A	53X334						
	SEC. 3	SEC. 4	SEC. 5							
	6.3VAC ⑥1.2A	6.3VAC ⑥8.7A								

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING DC RESISTANCE PRI.	RATING DC RESISTANCE SEC.	REPLACEMENT DATA TRUETONE PART No.	STANCOR PART No.	MERIT PART No.	Halldorson PART No.	TRIAD PART No.	RCA TYPE No.	NOTES
T2	170Ω	1000Ω	64X8	A-8125①	A-3003①	B6703①	A-97X①	209T1⑦ ⑭	Vert. Osc. Trans.
T3	367.86Ω tap ①	4.6Ω SEC. 2	53X339		HVO-9 & MWC-1 ②③		D-23 & WC-11② ⑥	232T1 & 212R1 ⑪	Horiz. Output Trans.
	9.98Ω, .56Ω, 19.98Ω, 34.38Ω, 52.68Ω	0Ω							
T4	1600Ω tap ④		51X156	A-8141	A-3039	21B06	104X	216T1	Vert. Output Trans.
	4.3Ω								
T5A	15.6Ω		9A2261	DY-9A①	MDF-72 ⑧	DF602⑦	Y-17 ⑤	211D2	Horiz. Deflection Coils
B	53Ω								Vert. Deflection Coils
T6	15.8Ω		9A2262		MWC-6 ⑦		WC-13⑦	213R1	Horiz. Linearity Coil
T7	.6Ω		9A2183	WC-4⑩				202R4⑩	Width

① Mount under chassis or use original shield.
② Drill new mounting holes.
③ Connect original terminal #6 to new terminal #9, original #5 to new #7, original #4 to new #5, original #1 to new #1. Connect primary of MWC-1 across terminals #1 and #3. Secondary to AFC if picture is out of phase, reverse secondary.
④ Connect terminal #8 to terminal #7, then connect original terminal #8 to new terminal #9, original #5 to new #7 and #8, original #4 to new #5, original #1 to new #3 Connect primary of WC-11 across terminals #1 & 3. Secondary to AFC if picture is out of phase, reverse secondary.
⑤ Use original horizontal deflection coil network, if necessary.
⑥ Enlarge mounting hole.
⑦ Connect to coded blue and green terminals.
⑧ Bend clip or use original slider and core.
⑨ Drill one new mounting hole.
⑩ Mount under chassis.
⑪ Use Fig. 4 of instruction booklet packed with unit for terminal connections.

TRANSFORMER (AUDIO OUTPUT)

ITEM No	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA TRUETONE PART No.	Stancor PART No	Merit PART No	Triad PART No	Halldorson PART No	Thordorson PART No	NOTES
T8	5.5KΩ	3.7Ω	51X150A	A-3877	A-2930	S-3X	Z1001	TS-24S51	① Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS SIZE	RATINGS FIELD	RATINGS V. C. IMP.	REPLACEMENT DATA TRUETONE PART No.	JENSEN PART No.	QUAM PART No	NOTES
SP1	6"	PM	3.7Ω	12A504	ST-108 Mod P8-X	6A1	

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA TRUETONE PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1A	UHF Ant. Coil	0Ω						
B	UHF Mixer Coil	0Ω						
C	UHF Osc. Coil	0Ω						
L2	UHF Ant. Coil Ind Inductor	0Ω						
L3	UHF Mixer Coil End Inductor	0Ω						
L4	UHF Osc. Coil End Inductor	0Ω						
L5	Fil. Choke	.5Ω						1.22 Microhenries
L6	Fil. Choke	.2Ω						1.22 Microhenries
L7	Cathode Choke	0Ω						.38 Microhenries
L8	RF Choke	0Ω						.38 Microhenries
L9	Parasitic Suppressor	0Ω						
L10	UHF IF Output Coil	0Ω	0Ω					Secondary tapped
L11A	VHF Ant. Coil	0ΩCT	0Ω	A9A2297-3				Channel 2
B	VHF Ant. Coil	0ΩCT	0Ω	A9A2297-4				Channel 3
C	VHF Ant. Coil	0Ω CT	0Ω	A9A2297-4				Channel 4
D	VHF Ant. Coil	0Ω CT	0Ω	A9A2297-5				Channel 5
E	VHF Ant. Coil	0Ω CT	0Ω	A9A2297-6				Channel 6
F	VHF Ant. Coil	0Ω CT	0Ω	A9A2297-7				Channel 7
G	VHF Ant. Coil	0Ω CT	0Ω	A9A2297-8				Channel 8
H	VHF Ant. Coil	0Ω CT	0Ω	A9A2297-9				Channel 9
I	VHF Ant. Coil	0Ω CT	0Ω	A9A2297-10				Channel 10
J	VHF Ant. Coil	0Ω CT	0Ω	A9A2297-11				Channel 11
K	VHF Ant. Coil	0Ω CT	0Ω	A9A2297-12				Channel 12
L	VHF Ant. Coil	0Ω CT	0Ω	A9A2297-13				Channel 13
M	UHF Ant. Coil Strip	0Ω CT	0Ω	A9A2297-91				UHF Position
L12	Fil. Choke	0Ω		34A-546				
L13	Neutr. C oil	0Ω		31B-296				
L14A	VHF RF, Mixer Grid & Osc. Coil	0Ω		A9A2298-2				Channel 2
B	VHF RF, Mixer Grid & Osc. Coil	0Ω		A9A2298-3				Channel 3
C	VHF RF, Mixer Grid & Osc. Coil	0Ω		A9A2298-4				Channel 4
D	VHF RF, Mixer Grid & Osc. Coil	0Ω		A9A2298-5				Channel 5
E	VHF RF, Mixer Grid & Osc. Coil	0Ω		A9A2298-6				Channel 6
F	VHF RF, Mixer Grid & Osc. Coil	0Ω		A9A2298-7				Channel 7
G	VHF RF, Mixer Grid & Osc. Coil	0Ω		A9A2298-8				Channel 8
H	VHF RF, Mixer Grid & Osc. Coil	0Ω		A9A2298-9				Channel 9
I	VHF RF, Mixer Grid & Osc. Coil	0Ω		A9A2298-10				Channel 10
J	VHF RF, Mixer Grid & Osc. Coil	0Ω		A9A2298-11				Channel 11
K	VHF RF, Mixer Grid & Osc. Coil	0Ω		A9A2298-12				Channel 12
L	VHF RF, Mixer Grid & Osc. Coil	0Ω		A9A2298-13				Channel 13
M	VHF RF, Mixer Grid & Osc. Coil Strip	0Ω		A9A2298-91				UHF Position
L15	Fil. Choke	0Ω		34A-575				
L16	RF Choke	0Ω		31B-295				
L17	1st. Video IF	.9Ω		31A-078				
L18	RF Choke	1.3Ω		31B-230				
L19	Fil. Choke	0Ω		9A2033	19-3001	TV-189	4903	1 Microhenry
L20	2nd. Video IF	.3Ω	.3Ω	9A2230	17-1063	TV-186	6349	
L21	Fil. Choke	0Ω		9A2033	19-3001	TV-189	4903	1 Microhenry
L22	3rd. Video IF	.3Ω	.3Ω	9A2230	17-1064	TV-186	6350	
L23	Fil. Choke	0Ω		9A2033	19-3001	TV-189	4903	1 Microhenry

TRUETONE
MODEL 2D1336A

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (cont)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA TRUETONE PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L24	RF Choke	2.5Ω		9A1979	19-3036	TV-180	4628	.36 Microhenry
L25	4th. Video IF	.2Ω		9A2226	17-1002	TV-101	6187	Includes trap
L26	Series Peaking Coil	7Ω		36A10	19-4060	TV-180 ■	6172 ■	60 Microhenries, wound on 22KΩ resistor
L27	Shunt Peaking Coil	24Ω		36A11	19-1923	TV-188	6174	500 Microhenries
L28	4.5MC Trap	.3Ω		9A2074	20-1004	TV-151	1470	
L29	Series Peaking Coil	2.4Ω		9A1979	19-3036	TV-180	6176	36 Microhenries
L30	Shunt Peaking Coil	8Ω		36A16	19-3075 ♦	TV-181 ♦	6172 ♦	80 Microhenries, wound on 1.5KΩ resistor
L31	Series Peaking Coil	12Ω		36A12	19-4160	TV-184 ■	4644 ■	160 Microhenries, wound on 22KΩ resistor
L32	Shunt Peaking Coil	14Ω		36A13	19-3180 †	TV-184 †	6154 †	190 Microhenries, wound on 3.9KΩ resistor
L33	1st. Sound IF	1.6Ω		9A2168	17-1031 ▲	TV-113 ‡	1470A **	
L34	2nd. Sound IF	1.4Ω	1.4Ω	9A2170		TV-113	6203	
L35	Ratio Det.	3.8Ω	.6ΩCT	9A2295 *	17-1033	TV-110	1468	Tertiary winding - .5Ω
L36	Horiz. Osc.	65Ω		9A2096	19-1576	TV-163	6210	

* Some Models use ratio det. part #9A2269 (has alphabetical terminal identification)
♦ Parallel with 1.5KΩ resistor
† Parallel with 3.9KΩ resistor
■ Parallel with 22KΩ resistor
▲ Drill mounting hole.
‡ Detune unused winding
** Add 47MMF capacitor externally.

FILTER CHOKE

ITEM No.	RATINGS TOTAL DIRECT CURRENT	RATINGS D. C. RESISTANCE	RATINGS INDUCTANCE (0 CURRENT 1000 ~)	REPLACEMENT DATA TRUETONE PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.
L37	.280ADC	42Ω	2.24 Hy.	52X91A	C-2326 ①		C-17X	C5037①	T-20C55

① Drill one new mounting hole.

FUSES

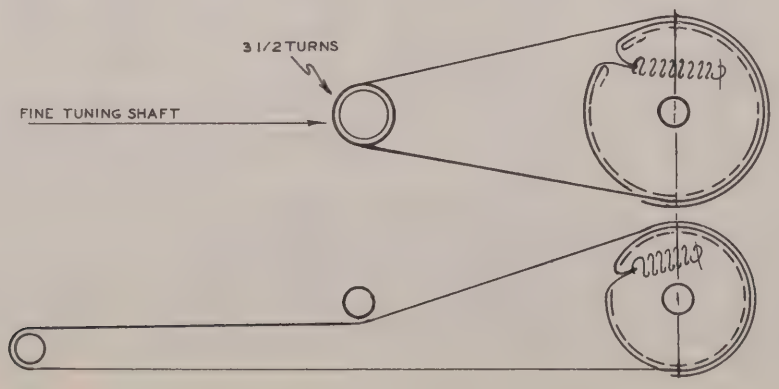
ITEM No.	TYPE	RATING	REPLACEMENT DATA TRUETONE PART No. FUSE	TRUETONE PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M1	3AG S/B	4/10A	16X147-3	16X146	313. 400 (3AG S/B-4/10)	357001	MDL 4/10	4405

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA TRUETONE PART No.	REPLACEMENT DATA SYLVANIA PART No.		NOTES
M2	1N72		1N82 or 1N82A		UHF Mixer (clip-in)

MISCELLANEOUS

ITEM No.	PART NAME	TRUETONE PART No.	NOTES
M3	Dial light	7A32	# 51 bayonet (2) VHF & UHF channel lights
M4	Tuner	25A1105	UHF
M5	Tuner	25A1109	VHF
M6	Trap	52X92	FM filter unit
M7	Switch	2A430	UHF-VHF changeover
M8	Magnet	2A426	Centering device
M9	Magnet	2A421	Ion trap
	Knob	12A820-1	Fine tuning
	Knob	10A821-1	Contrast
	Knob	10A822-1	Channel selector
	Knob	10A779	Volume
	Safety glass	18X178	
	Mask	4X1217-1	Model 35TV-43-9023A
	Mask	4X1217-2	Model 45TV-43-9023B
	Dial glass	58X767	UHF
	Cabinet back	S-14X73	Assembly



UHF DRIVE CORD STRINGING

TROUBLE SHOOTING AIDS (cont)

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST
DENVER, COLORADO

POWER

DEAD SET

If filaments fail to light, check AC interlock assembly, switch on volume control and T1. If filaments light, substitute V23 and V24. Check fuse M1, C1A, C2A, L37 and other components that form the B+ filter and decoupling network.

SMALL AND/OR DIM PIX

Substitute V23 and V24. Check B+ filter and decoupling network components.

HIGH VOLTAGE

LOSS OF HIGH VOLTAGE

Check by substitution V19, V20, V21 and V22. Check waveform W17.

If Satisfactory	If Unsatisfactory
Check R112, R113, R110, C105, C100, C101, T3, T5A, and other associated circuit components.	Check C96, C99, R106, R108 and other associated circuit components.

INSUFFICIENT HIGH VOLTAGE

Check by substitution V19, V20, V21, V22, V23 and V24. Check picture tube. Proceed as outlined under "Loss of High Voltage."

BLOOMING

Check by sbustitution V19, V20, V21, V22, V23, V24. Check T3, T5A, R112, R113, R110, C105, C100, C101, picture tube and other associated components for failure or change of value.

GENERAL

RASTER SOUND NO PIX

Follow procedure outlined under "Loss of Video".

RASTER PIX NO SOUND

Follow procedure outlined under "Weak or No Sound".

RASTER NO PIX NO SOUND

Check by substitution V2, V3, V4, V5, V6, and V7. Check associated circuit components. In case of UHF check V1.

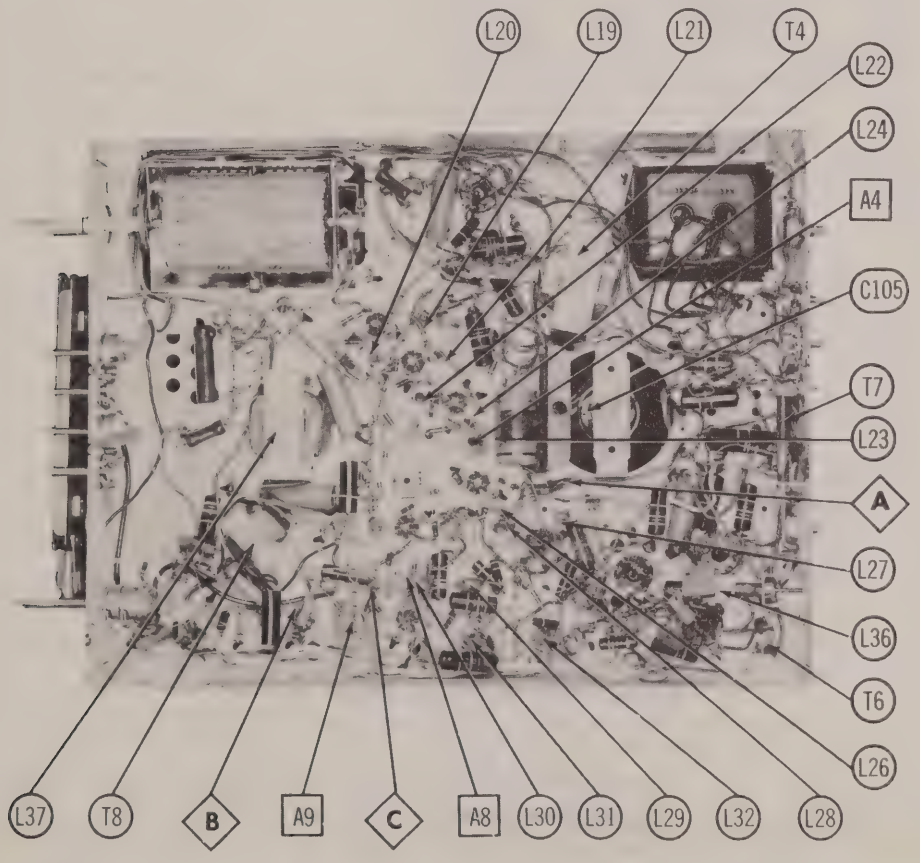
NO RASTER NO SOUND

Follow procedure outlined under "Dead Set".

INTERMITTENT STREAKS

Check video signal for interference pulses. Check high voltage section for corona discharge and arcing.

Symptoms shown are assumed and are not indicative of the quality and workmanship of this equipment.



CHASSIS BOTTOM VIEW-TRANS., INDUCTOR & ALIGN. IDENTIFICATION

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustments of the RF tuner oscillator circuit may be accomplished by removal of the channel selector and fine tuning knobs. The adjustments are accessible, one at a time, through the small hole in the cabinet to the right of the channel selector shaft.

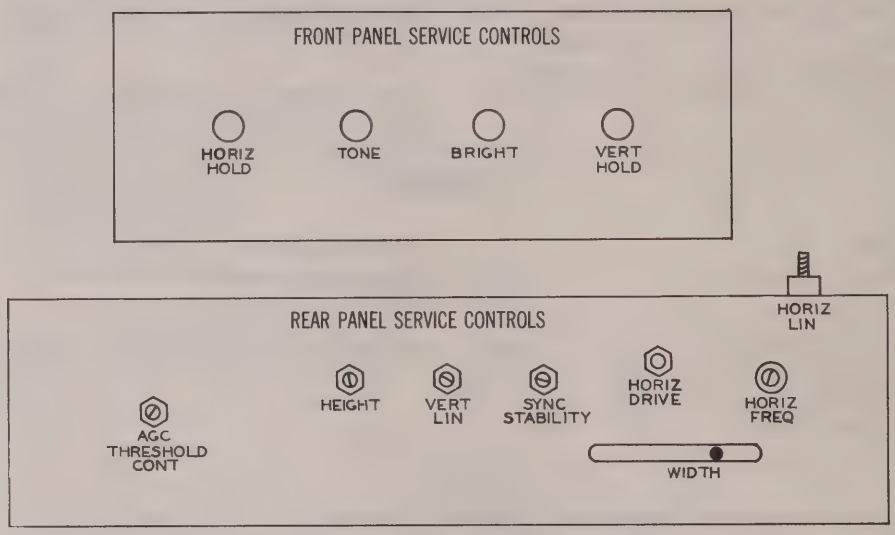
PICTURE TUBE SAFETY GLASS CLEANING

To clean safety glass, remove five wood screws holding metal strip at top of safety glass. Remove metal strip and safety glass. Use extreme caution when removing safety glass.

PICTURE TUBE REMOVAL

For picture tube removal it is necessary to remove chassis. (See disassembly instructions).

SERVICE ADJUSTMENT LOCATION



SPECIAL ADJUSTMENTS:

AGC THRESHOLD CONTROL

Tune in the strongest TV station available.

Turn the AGC threshold clockwise until a buzz in the sound and a washed out picture appears, then turn the control slightly counter clockwise for clearest picture and best sound.

SYNC STABILITY CONTROL

With the picture locked in slowly turn the sync stability control clockwise until bending occurs at top of picture. Turn control SLIGHTLY counter clockwise until bending disappears. In general, the weaker the signal area the more clockwise the control should be turned.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

Adjustment of the horizontal oscillator circuit can be made from the rear panel of the chassis. Set the horizontal hold control at the mid-position of its range and adjust the horizontal frequency slug (L36)until the picture synchronizes horizontally.

SOUND IF DETECTOR BUZZ AD JUSTMENT

To eliminate sound IF detector buzz, adjust the ratio detector secondary (L35) located on top of chassis. (See tube placement chart).

FUSES

One fuse is used for LV power supply protection. (For location, see tube placement chart).

CENTERING

Centering is accomplished mechanically by adjusting a magnetic ring around the neck of the picture tube located flush against the yoke cover. Turn the disc-like knob and at the same time rotate the ring around

DISASSEMBLY INSTRUCTIONS

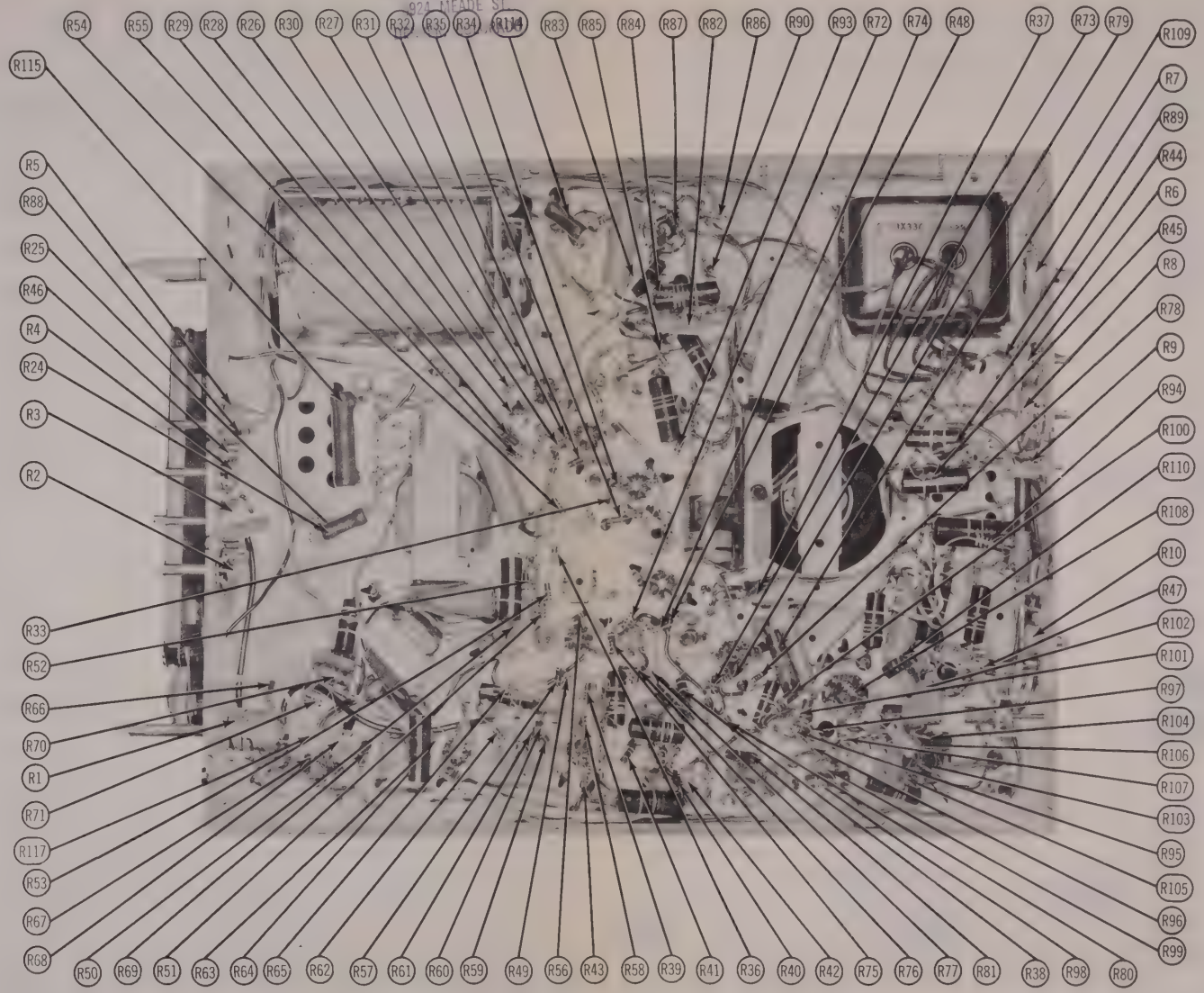
Remove 4 push on type control knobs from front panel.

Remove 2 wood and 2 metal screws. Remove rear cover.

Disconnect transmission lines, speaker plugs, built-in antenna.

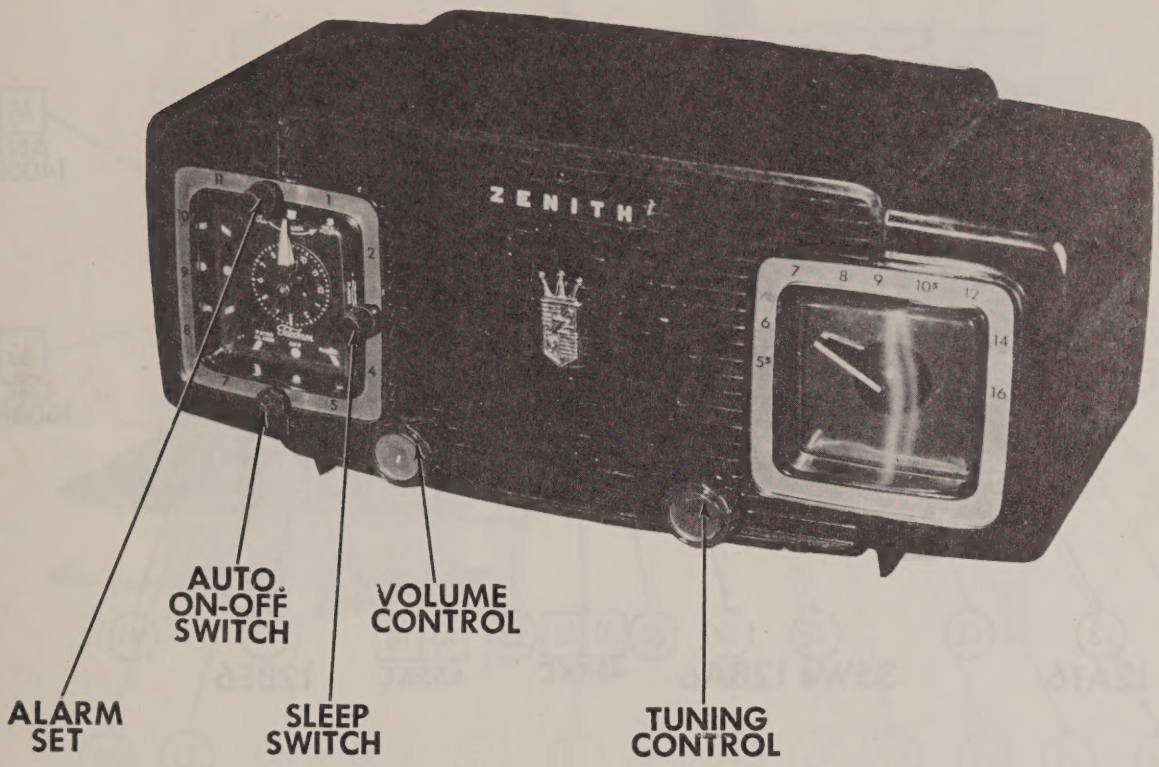
Remove 5 chassis bolts. Remove chassis.

Remove 4 speaker nuts. Remove speaker.



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

ZENITH MODELS
L515 (Ch. 5L06), L520 (Ch. 5L07)



ZENITH MODELS
L515 (Ch. 5L06), L520 (Ch. 5L07)

TRADE NAME	Zenith Models L515 (Ch. 5L06), L520 (Ch. 5L07)
MANUFACTURER	Zenith Radio Corp., 6001 Dickens Ave., Chicago. Ill.
TYPE SET	AC Operated AM Superheterodyne Receiver with Electric Clock
TUBES (Five)	Types 12BE6 Conv., 12BA6 IF Amp., 12AT6 Det.-AVC-AF Amp., 50C5 Audio Output, 35W4 Rectifier
POWER SUPPLY	110-120 Volts AC-60 Cycles
RATING	.25 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	535-1620KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
To set pointer, turn tuning capacitor fully closed and set pointer parallel with base of dial.
Loop should be maintained in same relative position to chassis as when receiver is in cabinet.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.5MFD	High side to pin 7 (grid) of 12BE6 (V1). Low side to B-.	455KC (400%Mod)	600KC	Across voice coil	A1, A2, A3, A4	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.		Loop	1600KC	1600KC	"	A5	Fashion loop of several of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		"	1400KC	1400KC	"	A6	"

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA: ZENITH PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RETMA BASE TYPE	NOTES
V1	Converter	12BE6	12BE6	7CH	
V2	IF Amplifier	12BA6	12BA6	7BK	
V3	Det-AVC-AF Amp.	12AT6	12AT6	7BT	
V4	Audio Output	50C5	50C5	7CV	
V5	Rectifier	35W4	35W4	5BQ	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: ZENITH PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	■80	150	22-2351	AFH2-19		B018		FP216	TVL-2442	
B	▲40	150								
C2	.05	200	22-829	P288-05	DF-503	PJ2S5		PT415	2TM-S5	
C3	250		22-1666	SI250	D6-251		GP1K-251	UC-5325	5GA-T25	
C4	10000		22-3	BPD-01	DD-103	TM5S1	811-01	DC-511	5HK-S1	
C5	47		22-6	BPD-00047	D6-470		GP1K-470	UC-5447	5GA-Q47	
C6	10000		22-3	BPD-01	DD-103	TM5S1	811-01	DC-511	5HK-S1	
C7	.01	400	22-1182	P488-01	D6-103	PTE4S1	GP2-333-103	PT401	4TM-S1	
C8	10000		22-3	BPD-01	DD-103	TM5S1	811-01	DC-511	5HK-S1	
C9	.05	200	22-829	P288-05		PJ2S5		PT415	2TM-S5	

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: ZENITH PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500KΩ	½	63-2393	Q11-133	AG-58-S	AB-59	U-50	Volume
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Not Req.	Attach to R1A

RESISTORS

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: ZENITH PART No.	IRC PART No.	NOTES
R2	22KΩ	½	63-1842	BTS-22K	
R3	68Ω	½	63-1737	BTS-68	
R4	2.2Meg	½	63-1926	BTS-2.2Meg	
R5	4.7 Meg	½	63-1940	BTS-4.7Meg	
R6	470KΩ	½	63-1898	BTS-470K	

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: ZENITH PART No.	IRC PART No.	NOTES
R7	470KΩ	½	63-1898	BTS-470K	
R8	150Ω	1	63-1977	BTA-150	
R9	1000Ω	1	63-965	BTA-1000	
R10	22Ω	1	63-1450		

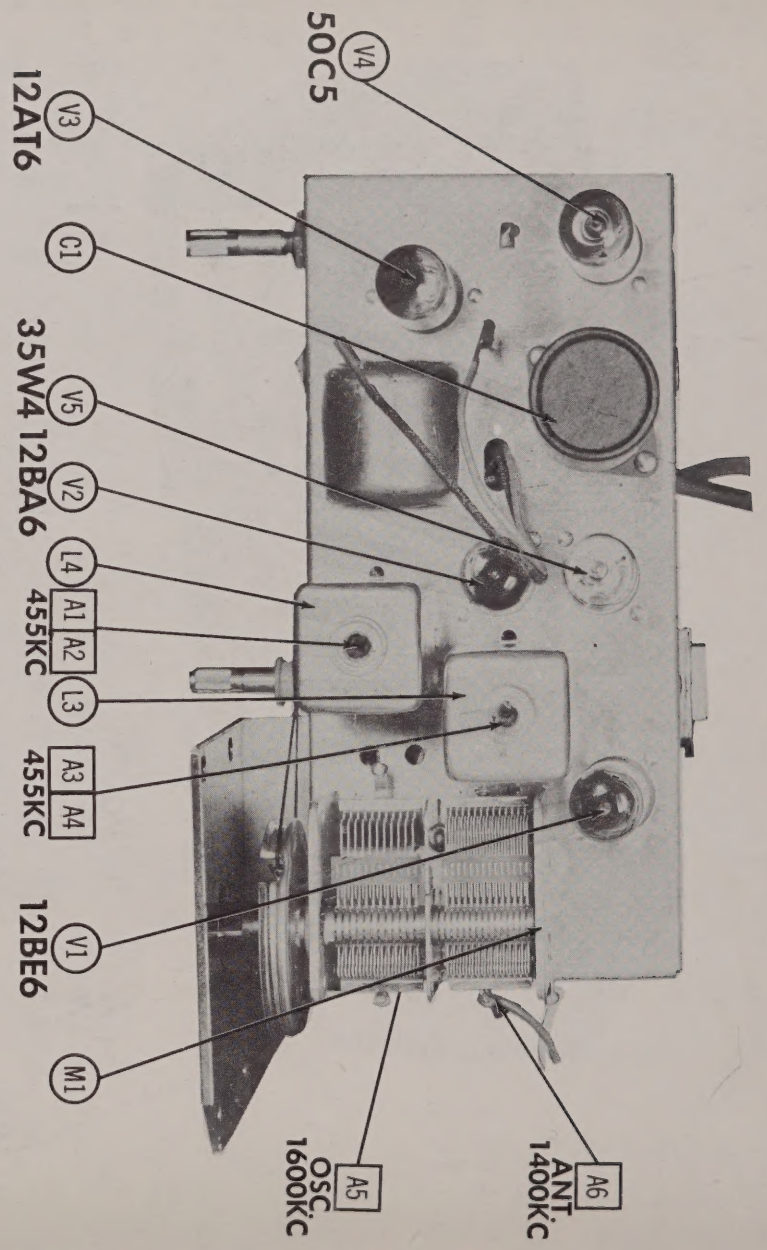
TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE: PRI.	IMPEDANCE: SEC.	REPLACEMENT DATA: ZENITH PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.	NOTES
T1	2.34KΩ	3.3Ω	95-1354	A-3330 ①	A-3031 ①		Z1102 ①		① Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS: SIZE	RATINGS: FIELD	RATINGS: V. C. IMP.	REPLACEMENT DATA: ZENITH PART No.	JENSEN PART No.	QUAM PART No.	NOTES
SP1	4"	PM	3.3Ω	49-713	ST-113 Mod P4-X	4A07	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

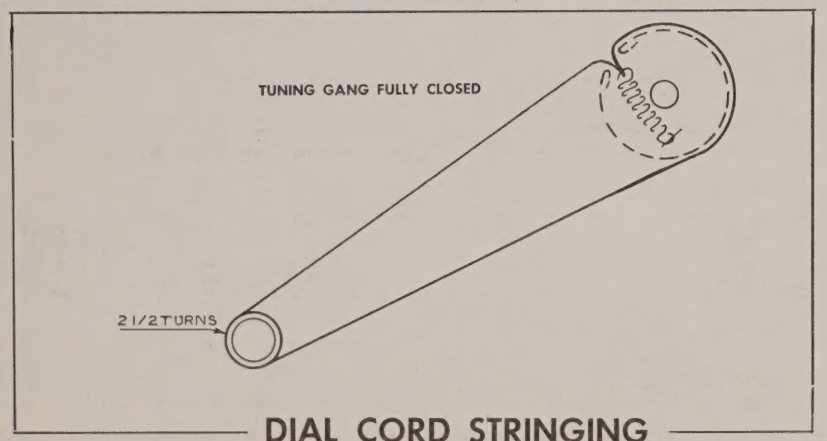
COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA: ZENITH PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	Loop Ant.	3.1Ω		S-20558 *				Includes cabinet back
L2	Osc. Coil	.7Ω	6Ω	S-18616	14-1074		70-Osc.	
L3	Input IF	20Ω	22Ω	95-1101	16-6666	BC-368	012-C1	
L4	Output IF	21Ω	21Ω	95-1102	16-6770 †	BC-355 †	12-C6 †	

* Model L515 uses Part # S-20393 in this application.
† Use adaptor plate and cout out center spade bolt mounting support.

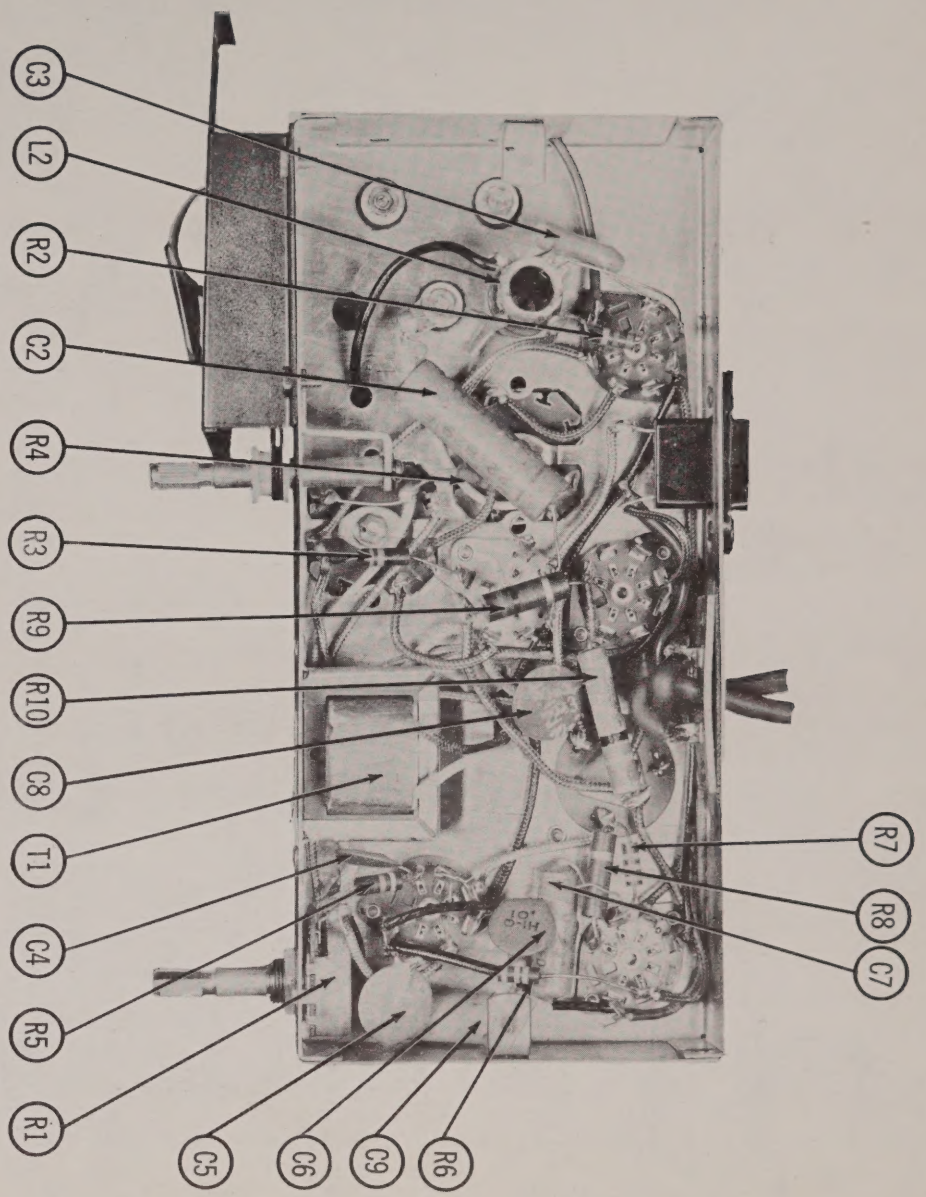
MISCELLANEOUS

ITEM No.	PART NAME	ZENITH PART No.	NOTES
M1	Tuning Cap.	22-2386	2 Section (34-457MMF, 27-195MMF)
M2A	Clock	S-19226	Model L520
B	Clock	S-19225	Model L520W
C	Clock	S-19224	Model L520G
D	Clock	S-19227	Model L520F
E	Clock	S-20998	Model L520R
F	Clock	S-18534	Model L515
G	Clock	S-18629	Models L515Y, W, G, F
	Cabinet	14-1621	Model L520
	Cabinet	14-1623	Model L520W
	Cabinet	14-1624	Model L520G
	Cabinet	14-1625	Model L520F
	Cabinet	14-1647	Model L520R
	Cabinet	14-1385	Model L515
	Cabinet	14-1612	Model L515W
	Cabinet	14-1613	Model L515F
	Cabinet	14-1614	Model L515G
	Cabinet	14-1367	Model L515Y
	Knob	46-904	(3) Clock Model L520 , L515
	Knob	46-940	(3) Clock Model L520W
	Knob	46-985	(3) Clock Model L520G
	Knob	46-951	(3) Clock Model L520F
	Knob	46-905	(3) Clock Model L520R , L515W, F, G, Y
	Knob	46-1222	(2) Volume & tuning Model L520
	Knob	46-1224	(2) Volume & tuning Model L520W
	Knob	46-1225	(2) Volume & tuning Model L520G
	Knob	46-1226	(2) Volume & tuning Model L520F
	Knob	46-1262	(2) Volume & tuning Model L520R
	Knob	46-943	(2) Volume & tuning Model L515
	Knob	46-941	(2) Volume & tuning Models L515W, F, G, Y
	Crystal	192-155	(2) Clock face & tuning dial (Model L520)
	Crystal	192-145	(2) Clock face & tuning dial (Model L515)

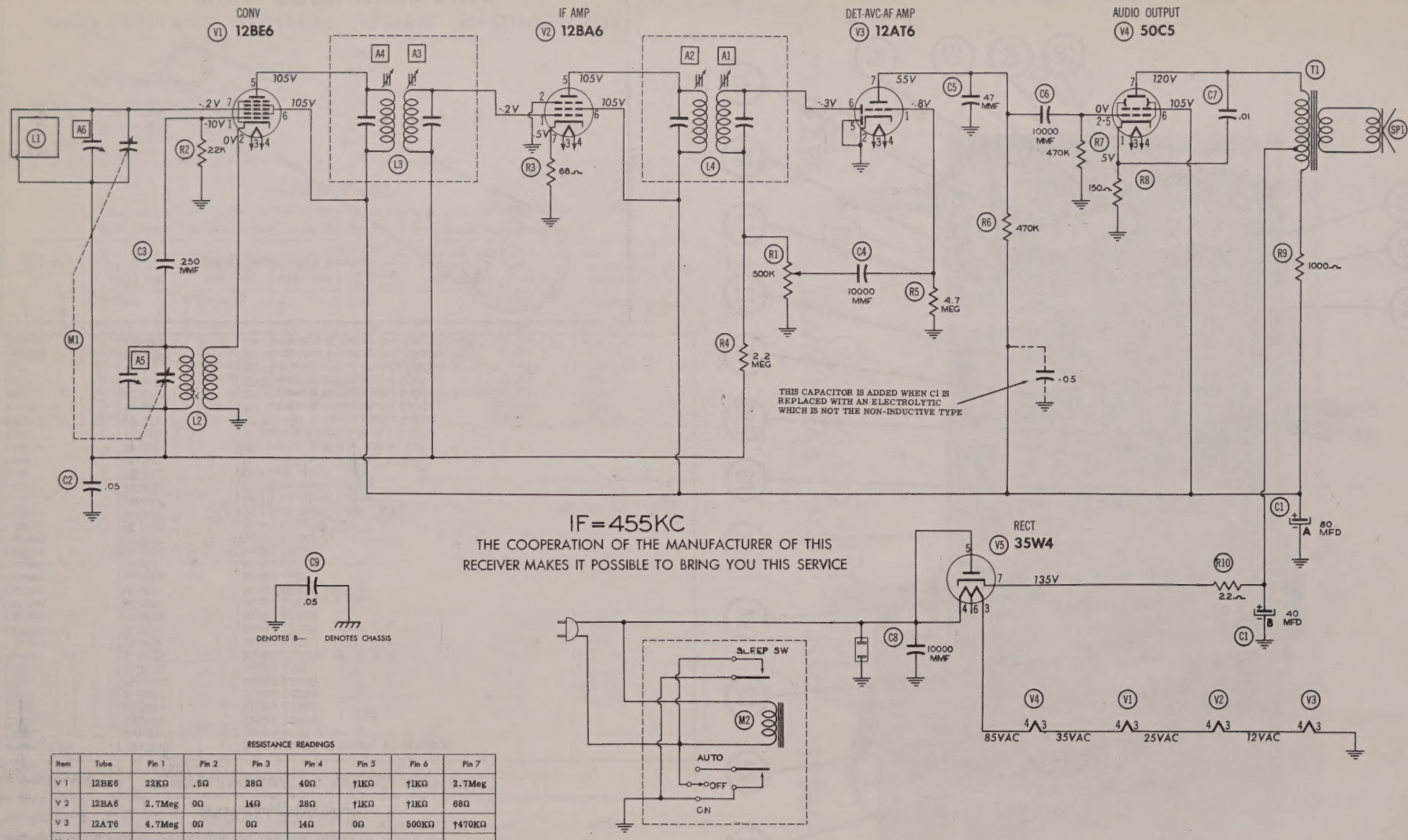


DIAL CORD STRINGING

CHASSIS—BOTTOM VIEW



ZENITH MODEL L515 (Ch. 5L06)



IF=455KC

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	12BE6	22KΩ	.5Ω	28Ω	40Ω	†1KΩ	†1KΩ	2.7Meg
V 2	12BA6	2.7Meg	0Ω	14Ω	28Ω	†1KΩ	†1KΩ	68Ω
V 3	12AT6	4.7Meg	0Ω	0Ω	14Ω	0Ω	500KΩ	†470KΩ
V 4	50C5	150Ω	470KΩ	40Ω	110Ω	470KΩ	†1KΩ	†250Ω
V 5	35W4	†30Ω	INF	110Ω	155Ω	155Ω	145Ω	300KΩ

† MEASURED FROM PIN 7 OF V5

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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